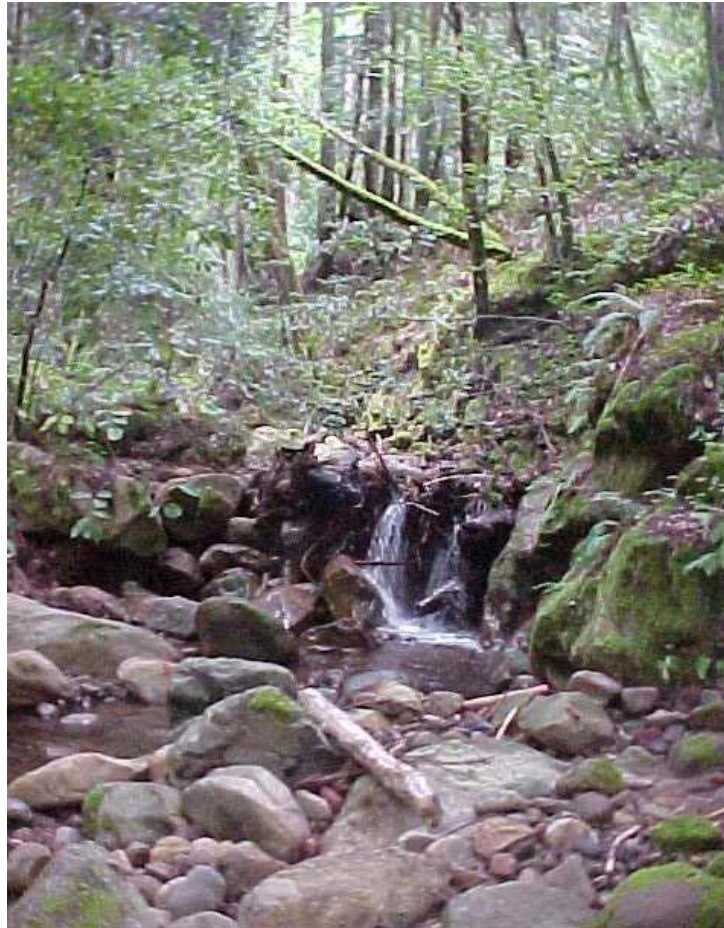


Modified Completion Report

Monitoring

January 23, 2006



Modified Completion Report Monitoring

[http://
www.bof.fire.ca.gov/board/msg_archives](http://www.bof.fire.ca.gov/board/msg_archives)

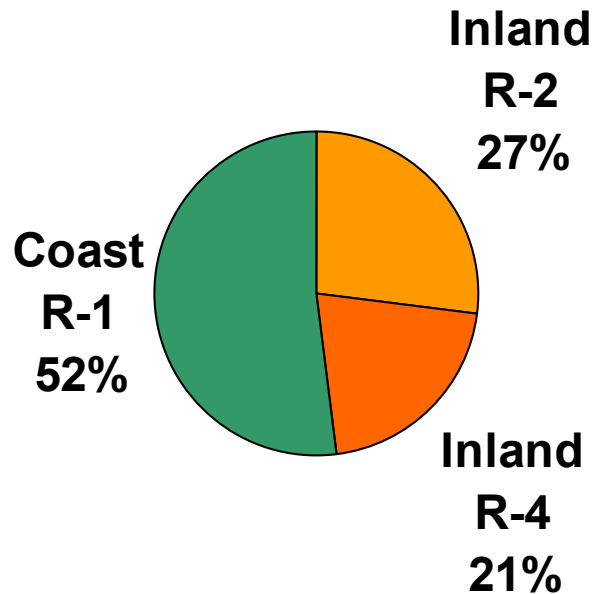
Available on-line at the Monitoring Study Group's archived document page:

- This presentation,
- MCR Methods & Procedures, and
- Draft of the final MCR Report.

Modified Completion Report Monitoring 2001 to 2004

- Sample size was 12.5% of THPs undergoing Completion Report field inspections.
- Used CDF's Forest Practice Inspectors to collect the monitoring data.

Modified Completion Report Monitoring 2001 to 2004



- 281 THPs Sampled
 - 52% Coast District (R-1)
 - 48% Inland Districts (R-2 & R-4)





Modified Completion Report Monitoring

- Watercourse and Lake Protection Zones (WLPZs)
 - WLPZ Percent Total Canopy
 - WLPZ Erosion Features
- Roads
- Watercourse Crossings

Modified Completion Report Monitoring

http://

www.bof.fire.ca.gov/board/msg_archives

- The draft Final Report,
- MCR Methods and Procedures, and
- This Presentation

Available on-line at the
Monitoring Study Group's (MSG's)
Archived Documents page.

Modified Completion Report Monitoring

WLPZ Canopy

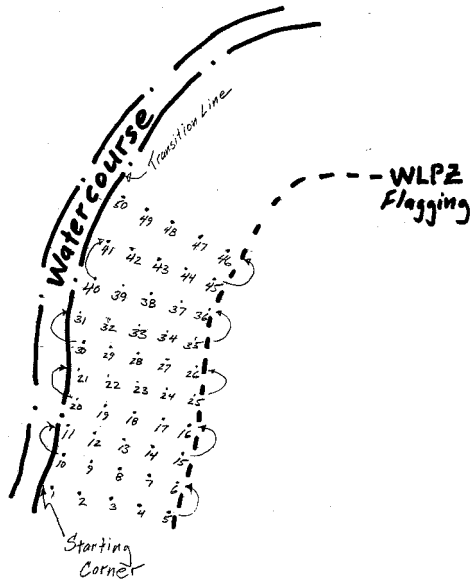
- 281THPs sampled, 187 with WLPZs.



Modified Completion Report Monitoring

WLPZ Canopy

- Randomly located 200 ft WLPZ segments for Class I and II watercourses.
- A 50 point grid pattern and a sighting tube are used for measurement.



Average Percent Total Canopy

<i>Class I & II WLPZs</i>	Overall	No Harvest	Harvest
Coast (Region 1)	84% n = 110	86% n = 55	82% n = 55
Inland North (Region 2)	68% n = 49	72% n = 12	67% n = 37
Inland South (Region 4)	73% n = 28	69% n = 15	77% n = 13

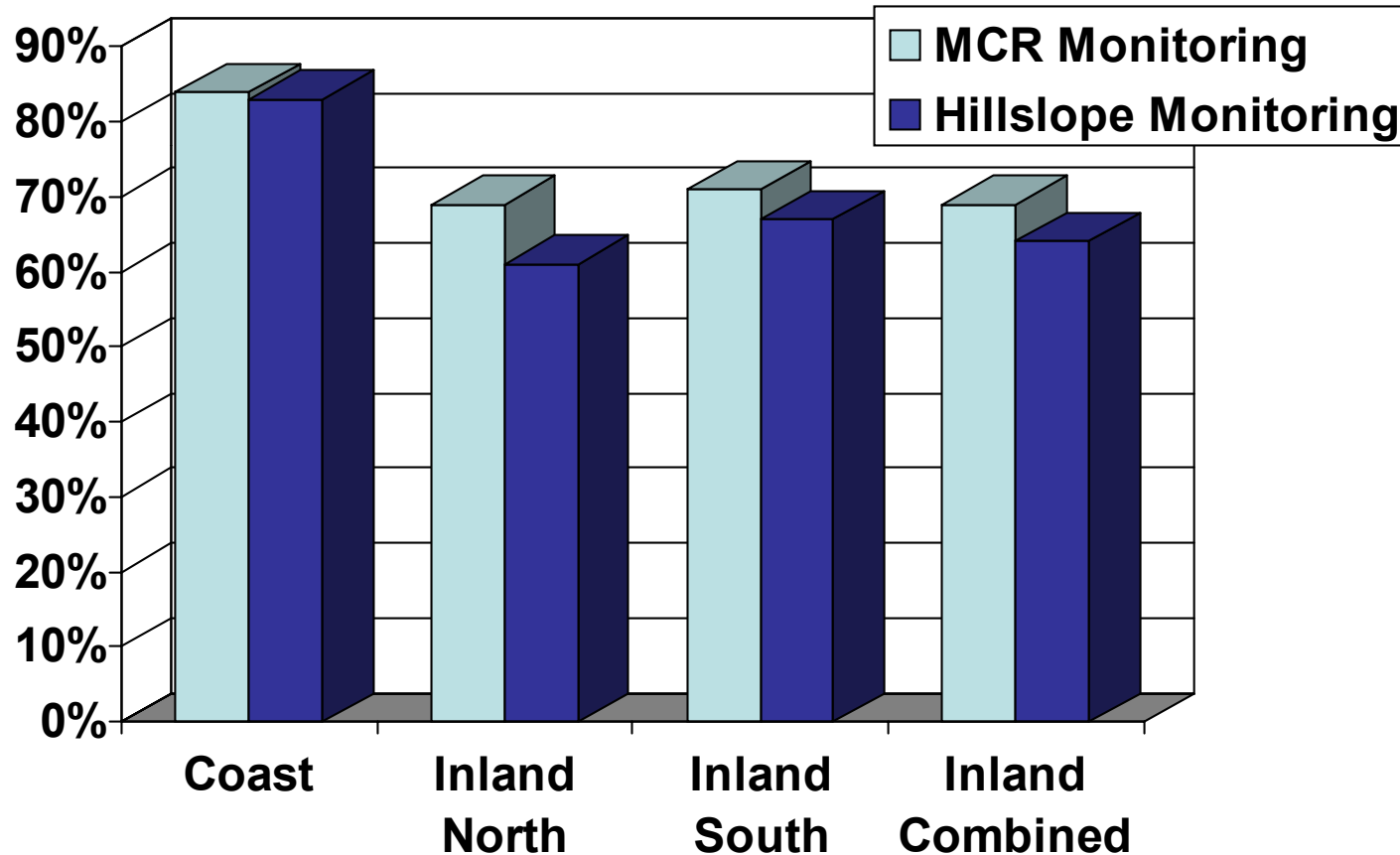
Average Percent Total Canopy

<i>Class / WLPZs</i>	Overall	No Harvest	Harvest
Coast (Region 1)	84% n = 29	83% n = 14	84% n = 15
Inland North (Region 2)	69% n = 18	74% n = 3	68% n = 15
Inland South (Region 4)	71% n = 5	65% n = 2	75% n = 3

Average Percent Total Canopy

<i>Class II WLPZs</i>	Overall	No Harvest	Harvest
Coast (Region 1)	84% n = 81	87% n = 41	81% n = 15
Inland North (Region 2)	67% n = 31	70% n = 9	65% n = 22
Inland South (Region 4)	73% n = 23	70% n = 13	78% n = 10

Comparison of Class I WLPZ Average Percent Total Canopy Results

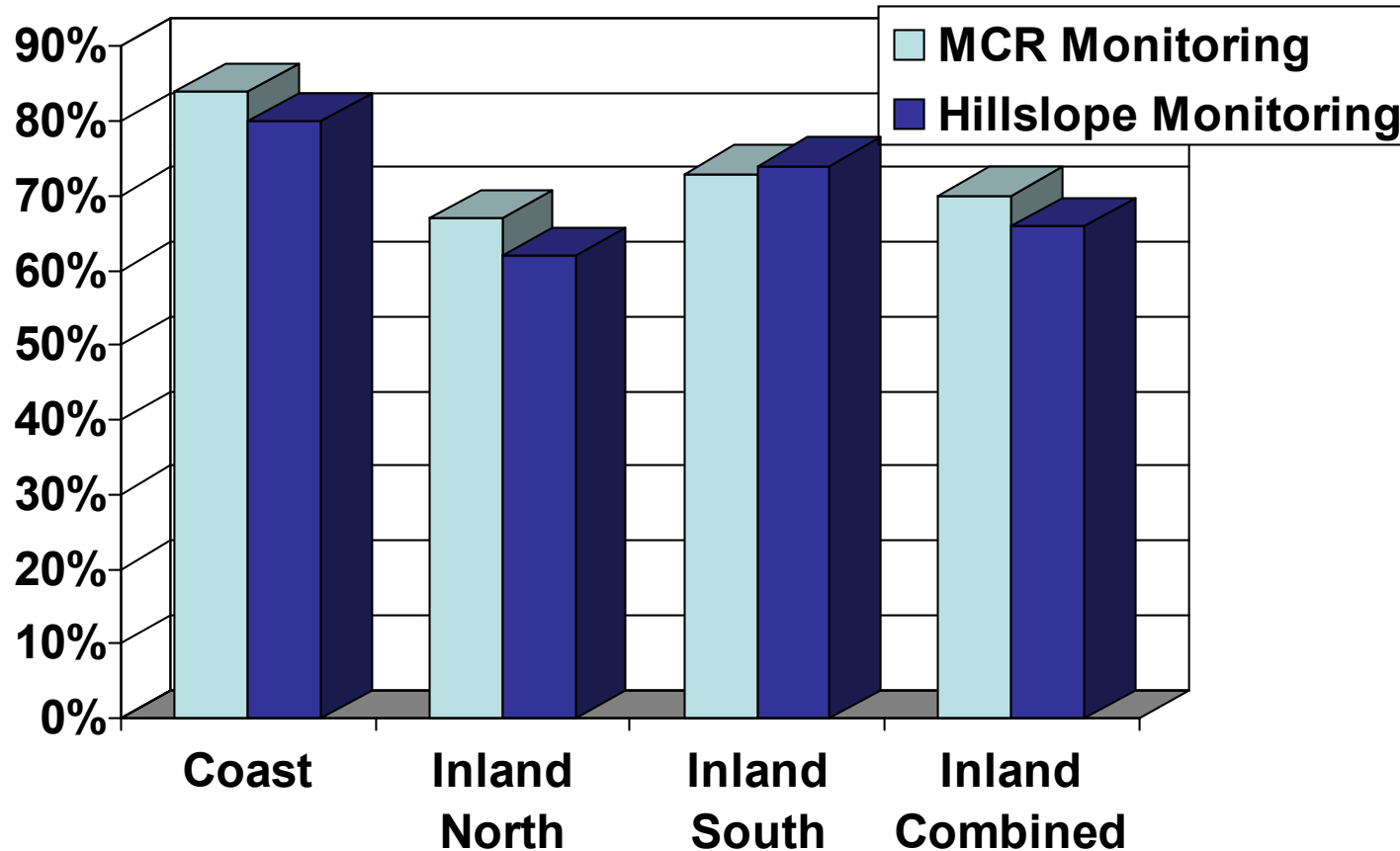


Comparison of Class I

WLPZ Average Percent Total Canopy Results

Class I Comparison	MCR Monitoring (2001-2004) Class I WLPZ percent total canopy	Hillslope Monitoring (1999-2001) Class I WLPZ percent total canopy
Coast (Region 1)	84% n = 29	83% n = 27
Inland North (Region 2)	69% n = 18	61% n = 17
Inland South (Region 4)	71% n = 5	67% n = 13
Inland (Regions 2&4 Combined)	69% n = 23	64% n = 30 DRAFT

Comparison of Class II WLPZ Average Percent Total Canopy Results



Comparison of Class II

WLPZ Average Percent Total Canopy Results

Class II Comparison	MCR Monitoring (2001-2004) Class II WLPZ percent total canopy	Hillslope Monitoring (1999-2001) Class II WLPZ percent total canopy
Coast (Region 1)	84% n = 81	80% n = 109
Inland North (Region 2)	67% n = 31	62% n = 46
Inland South (Region 4)	73% n = 23	74% n = 19
Inland (Regions 2&4 Combined)	70% n = 54	66% n = 65 DRAFT

WLPZ

Erosion Features

- Of 187 WLPZs sampled, 19 WLPZs (10%) had one or more erosion features.
- Of the 19 WPLZs with erosion features, only 2 WLPZs (1%) had erosion features related to current timber operations.

WLPZ Erosion Features Related to Current THP

- 1 with sediment deposition from landing
- 1 with gully (<70% groundcover)

WLPZ Erosion Features

Not Related to Current Operations

- 6 related to inner gorges
- 2 related to streambank failures
- 1 sediment deposition from a scarp
- 4 related to old skid trails/roads
- 1 gully originating at county road
- 1 related to an eroding cow trail
- 1 related to a breached irrigation ditch

Modified Completion Report Monitoring Roads



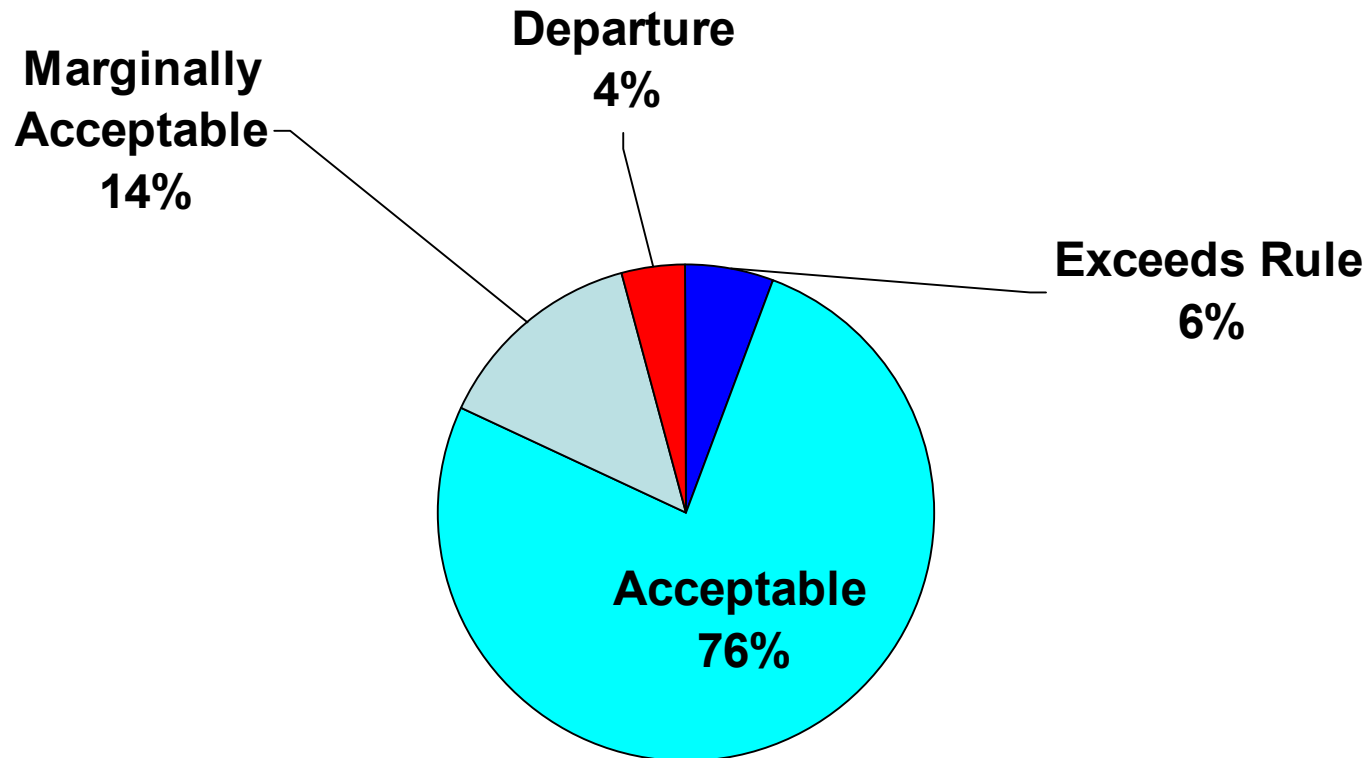
- 244 randomly-selected, one-thousand foot road segments sampled and rated for implementation .
(244,000 feet is about 46 miles)
- 1,991 road features rated for Forest Practice Rule (FPR) implementation .

Modified Completion Report Monitoring Roads: FPR Implementation

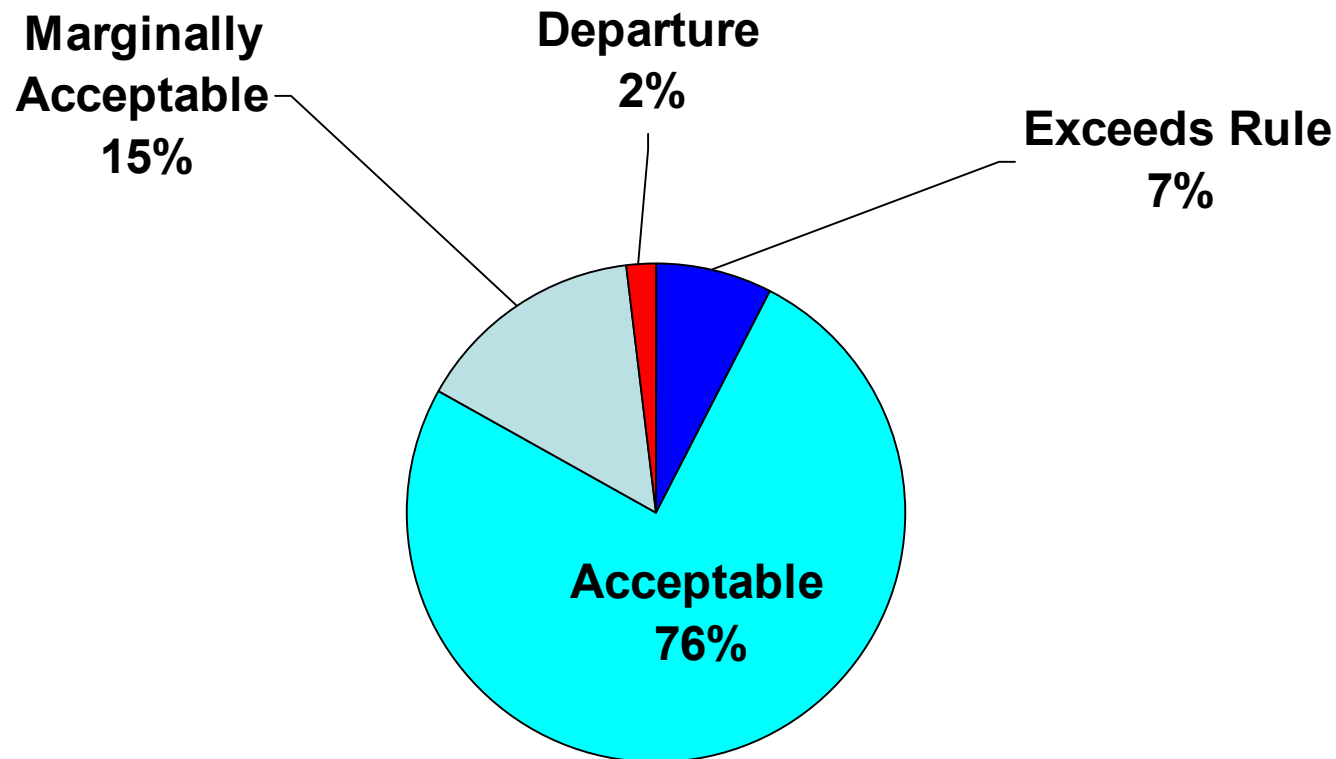


- 83 departures total or about 1.8 departures per mile of road.
- However, departures tend to be clustered, 5 road segments (2%) account for 33 departures (40%).

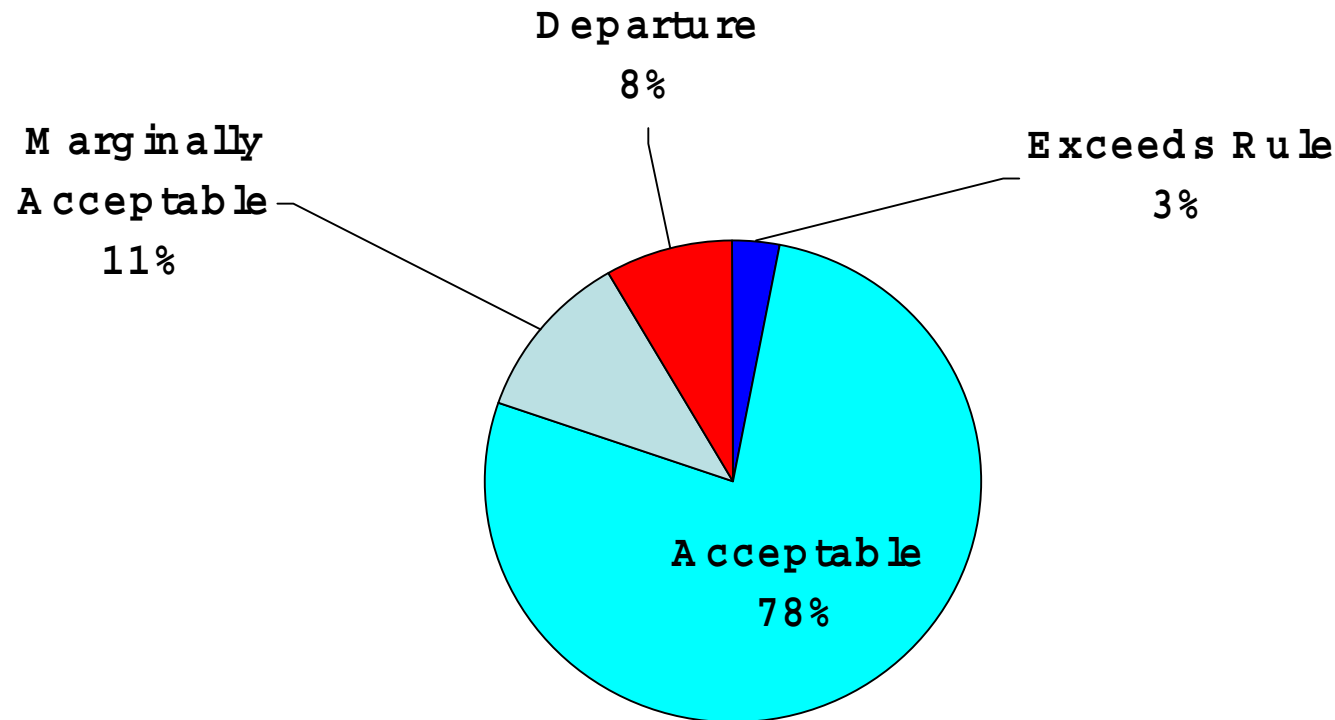
Road Features Rated for Implementation $n = 1,991$



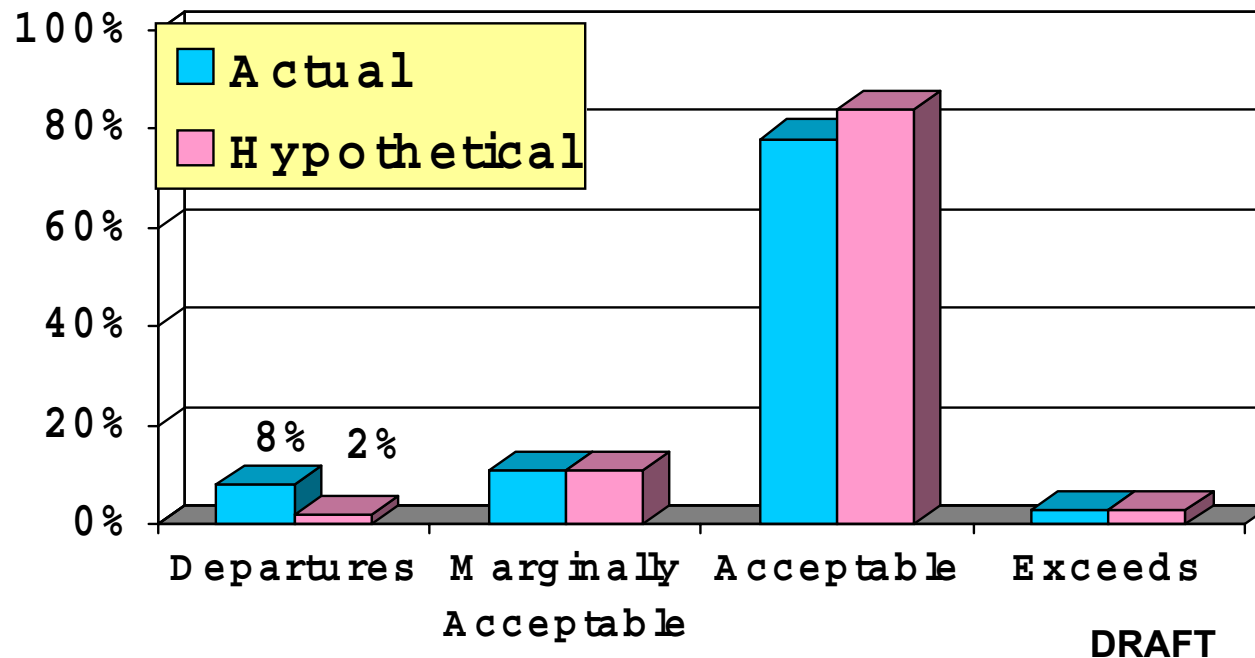
Coast (R-1) Road Features Rated for Implementation $n = 1,285$



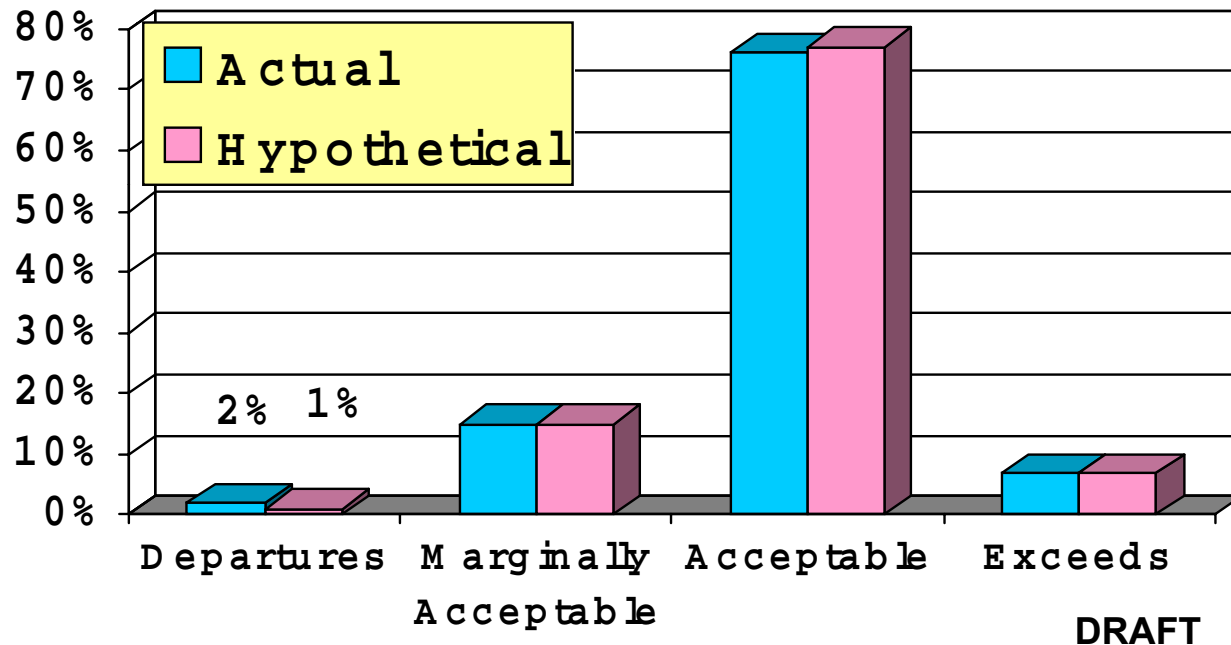
Inland (R-2 & R-4) Road Features Rated for Implementation $n = 706$



Inland (R-2 & R-4) Hypothetical Exercise: Find and Fix the Worst 6% of Roads Segments



Coast (R-1) Hypothetical Exercise: Find and Fix the Worst 6% of Roads Segments

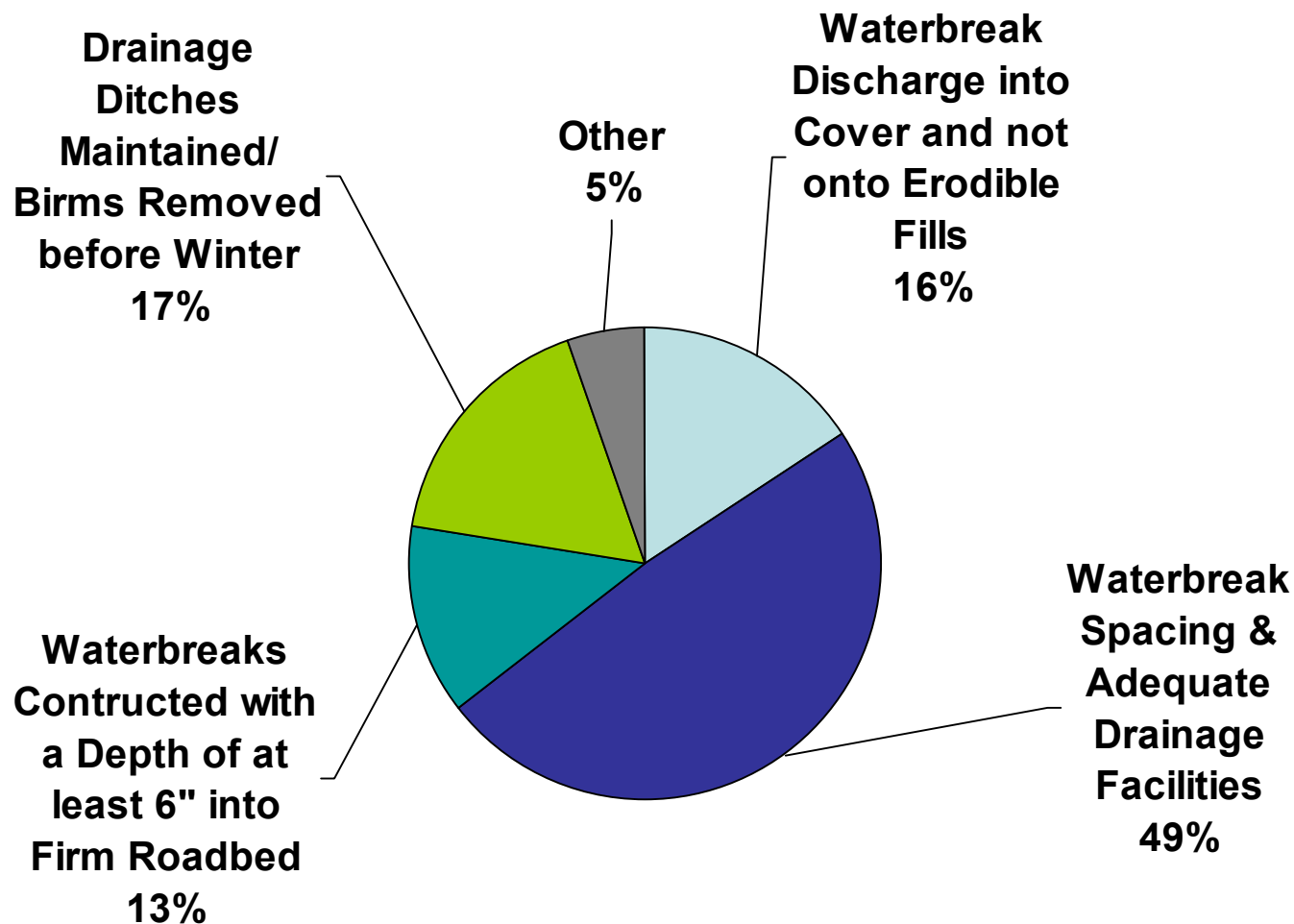


Modified Completion Report Monitoring Roads: FPR Implementation

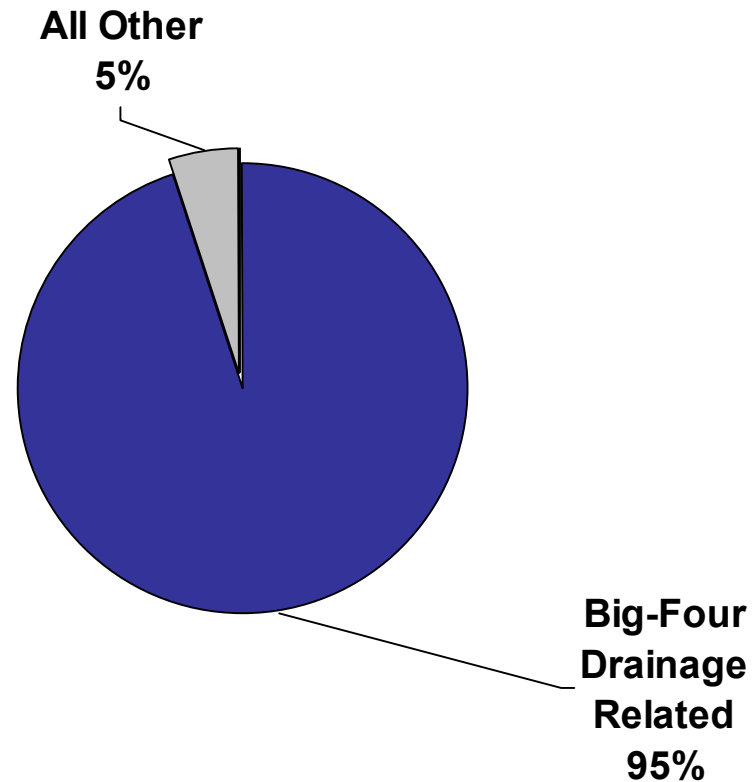


- Departures exhibit a pattern.
- In a word it's **"DRAINAGE."**

Road-related Departures from FPRs



Drainage, Drainage, Drainage

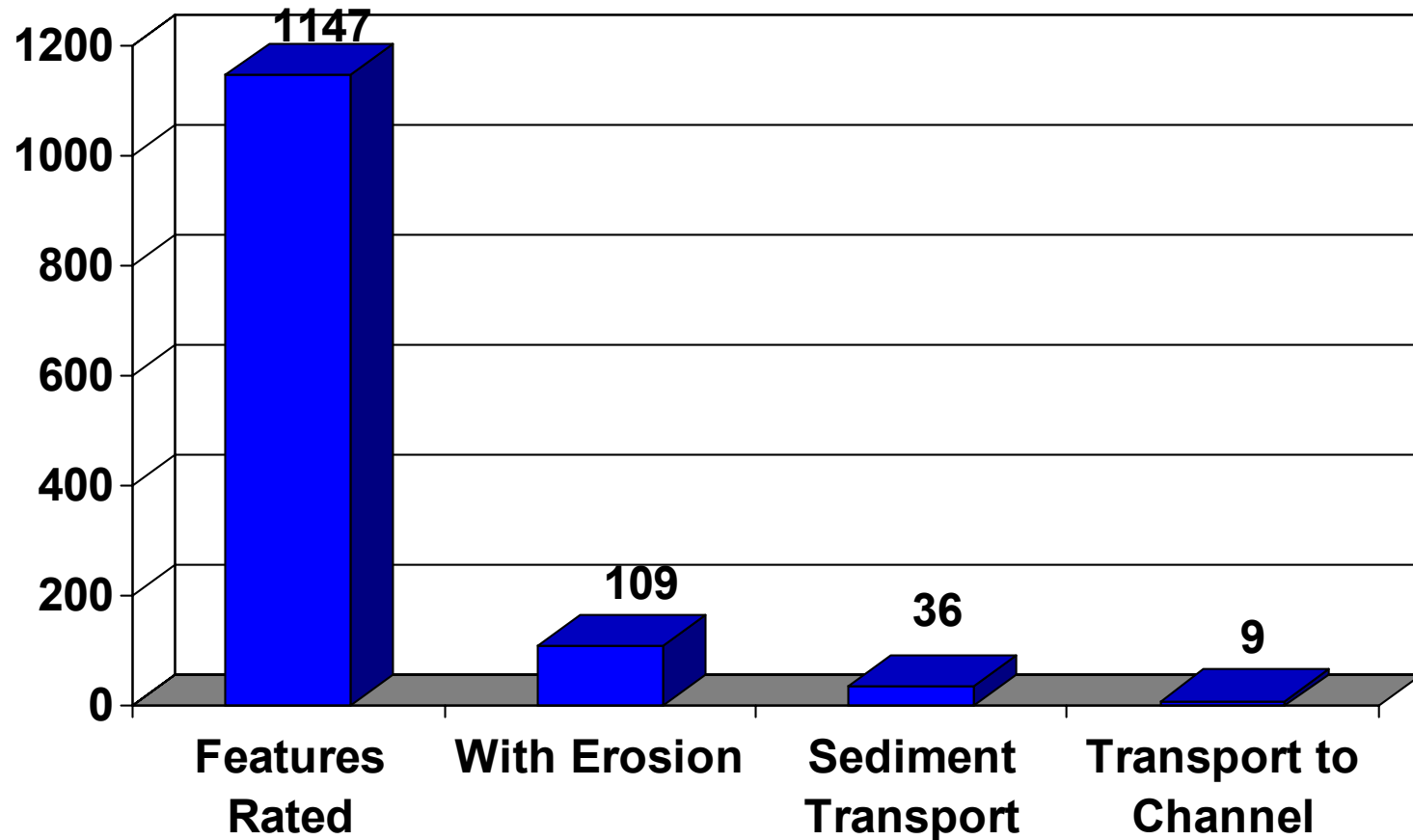


Modified Completion Report Monitoring Roads: FPR Effectiveness

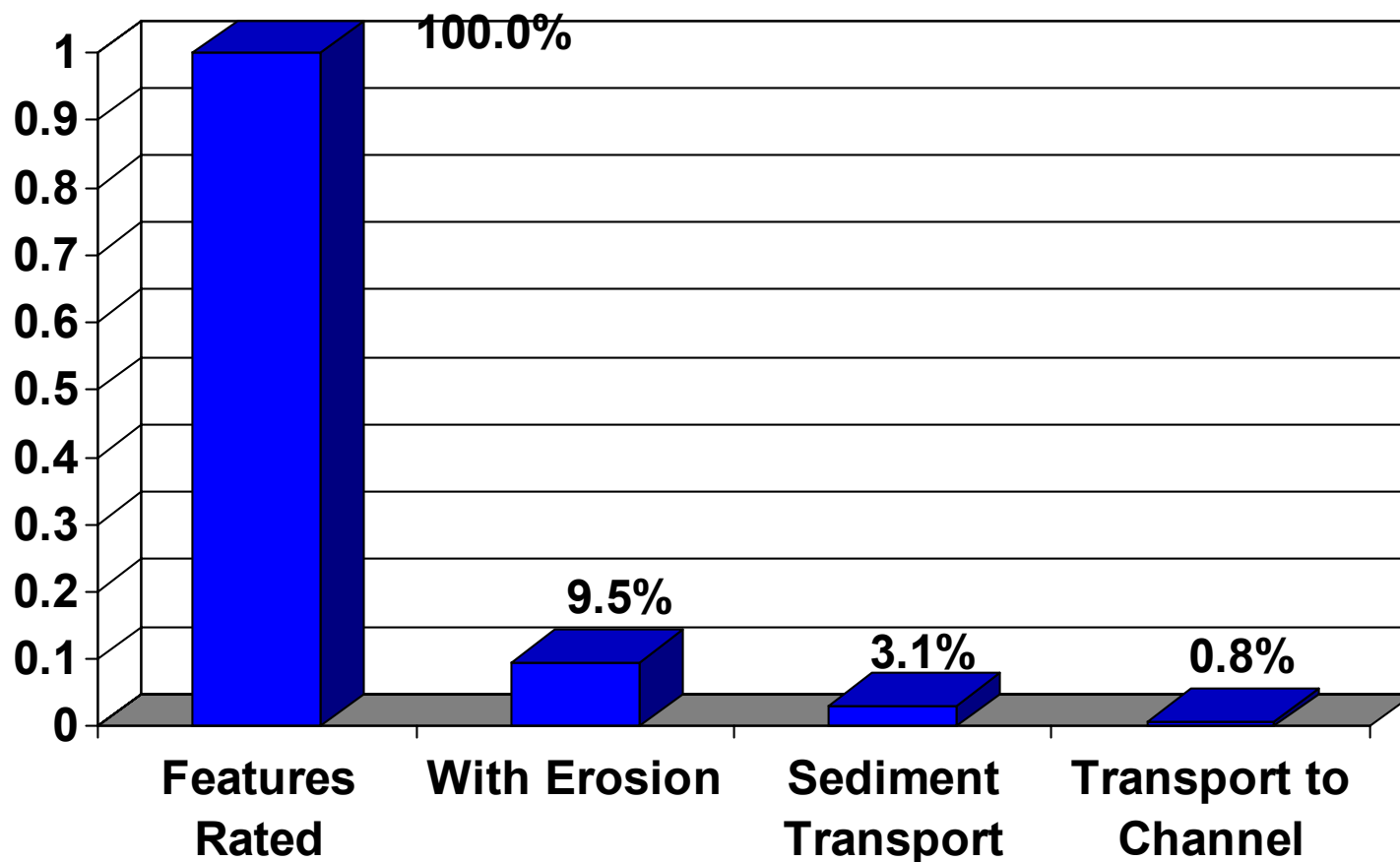


- Of 244 road segments sampled:
- 130 road segments were rated for effectiveness.
- These 130 road segments include 1,147 road-related features that were rated for effectiveness.

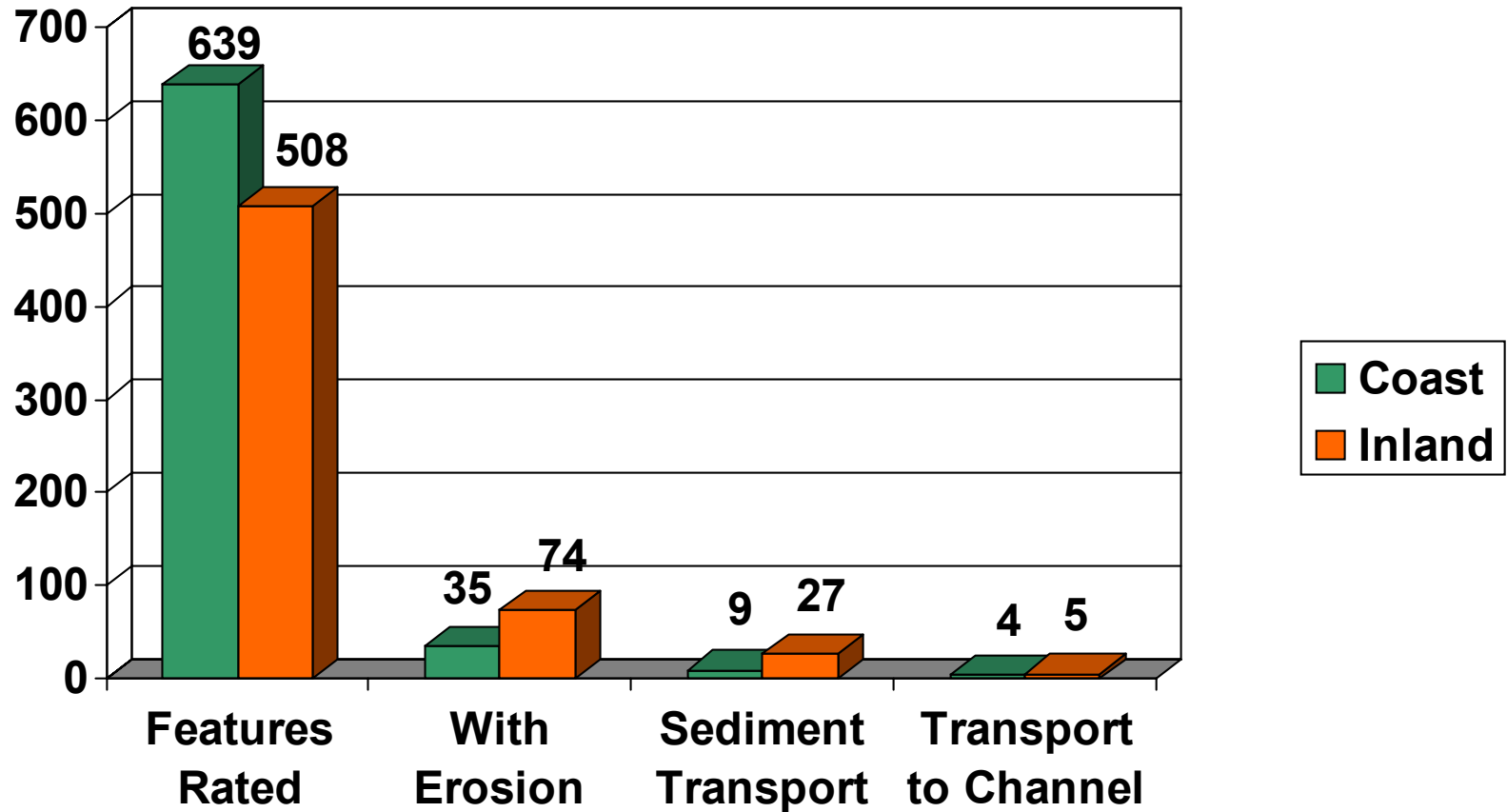
Road Features Rated for Effectiveness



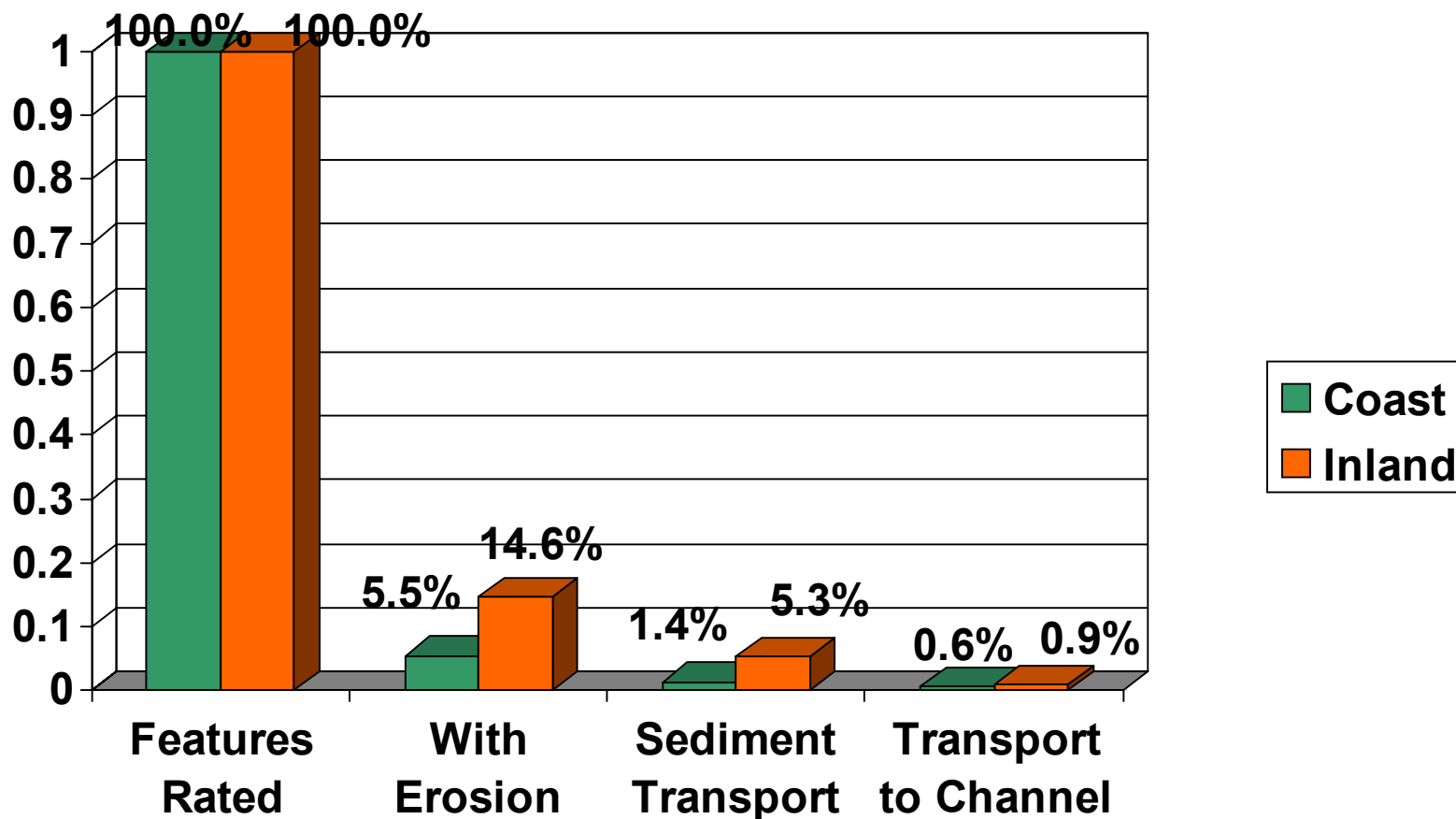
Road Features Rated for Effectiveness as Percentages



Road Features Rated for Effectiveness



Road Features Rated for Effectiveness as Percentages



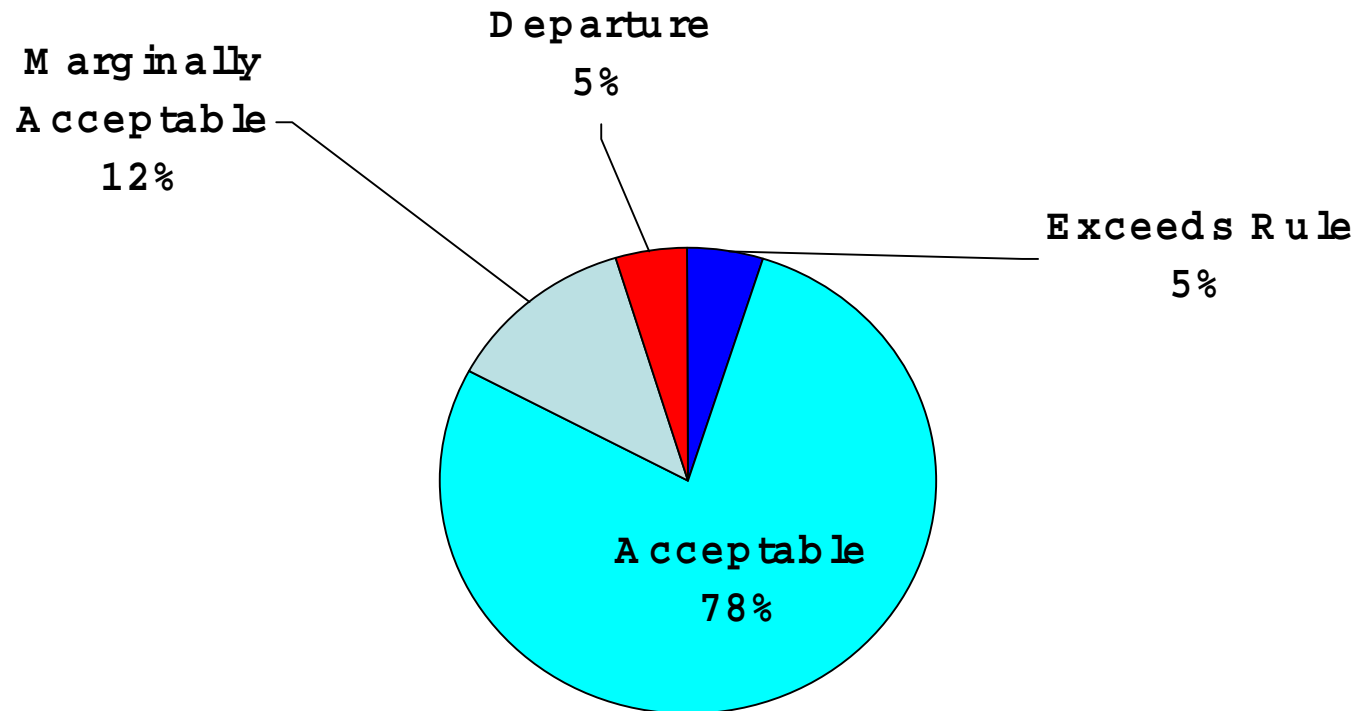
Road Feature Implementation and Effectiveness



- Better implementation results in better effectiveness, but not perfection.
- Departures are much more likely to result in erosion, sediment transport, and transport to channels.

Implementation Ratings for Road Features Rated for Effectiveness

n = 1,147



<u>Road-related Features Implementation Rating</u>	Erosion	Sediment Transport	Transport to Channel
Exceeds Rule/THP requirement n = 57	2%	0%	0%
Acceptable n = 893	5%	1%	1%
Marginally Acceptable n = 142	23%	9%	1%
Departure n = 55	53%	35%	11%

Transport to Channel

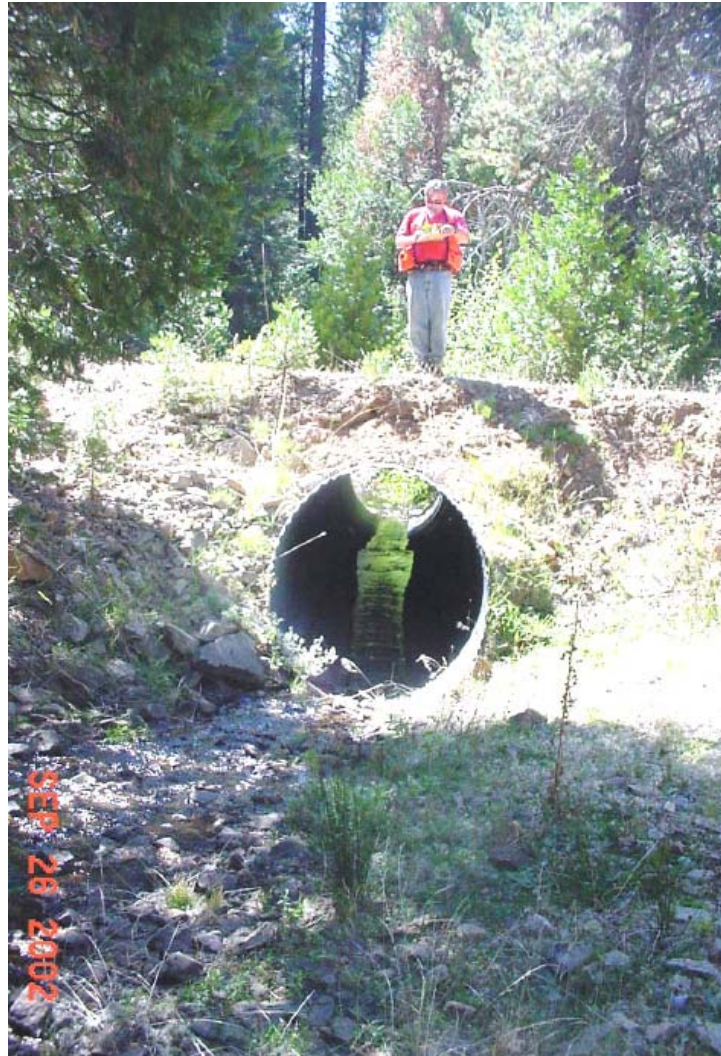
- Evidence of transport to channel was observed on 9 features out of 1,147 rated for effectiveness or about 0.8%.
- Implementation ratings for these 9 features included:
 - 3 Acceptable,
 - 1 Marginally Acceptable, and
 - 5 Departures

Transport to Channel

- Two features rated as acceptable and one feature rated as marginally acceptable involved watercourse crossings. One rated as acceptable involved a drainage feature and a high intensity storm.
- The 5 features rated as departures:
 - 2 involved discharges onto erodible materials or failure to discharge into cover.
 - 3 involved inadequate number of drainage facilities/structures or inadequate spacing.

Modified Completion Report Monitoring

Watercourse Crossings



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Modified Completion Report Monitoring

Watercourse Crossings

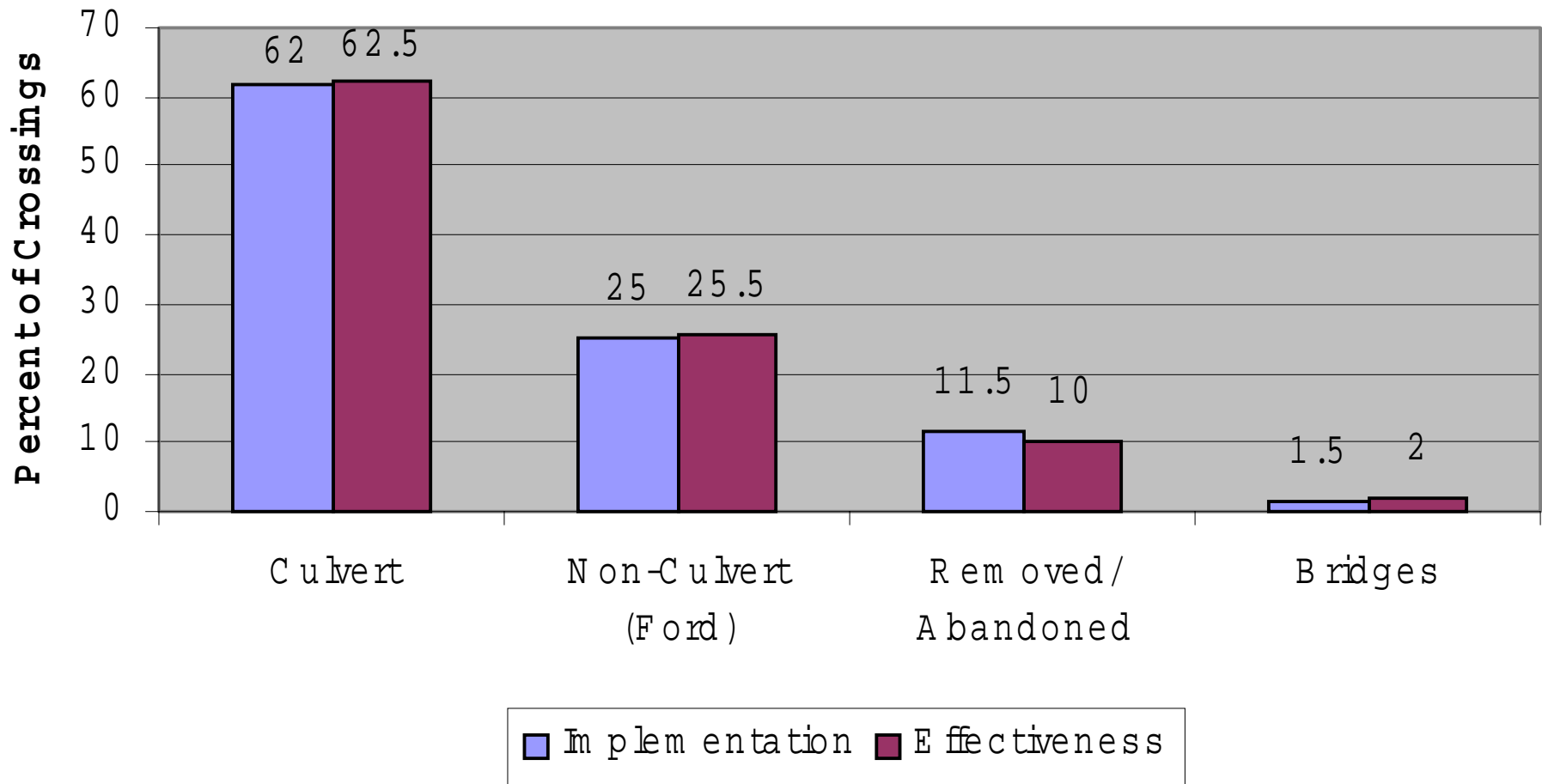


357 Watercourse Crossings
sampled, including:

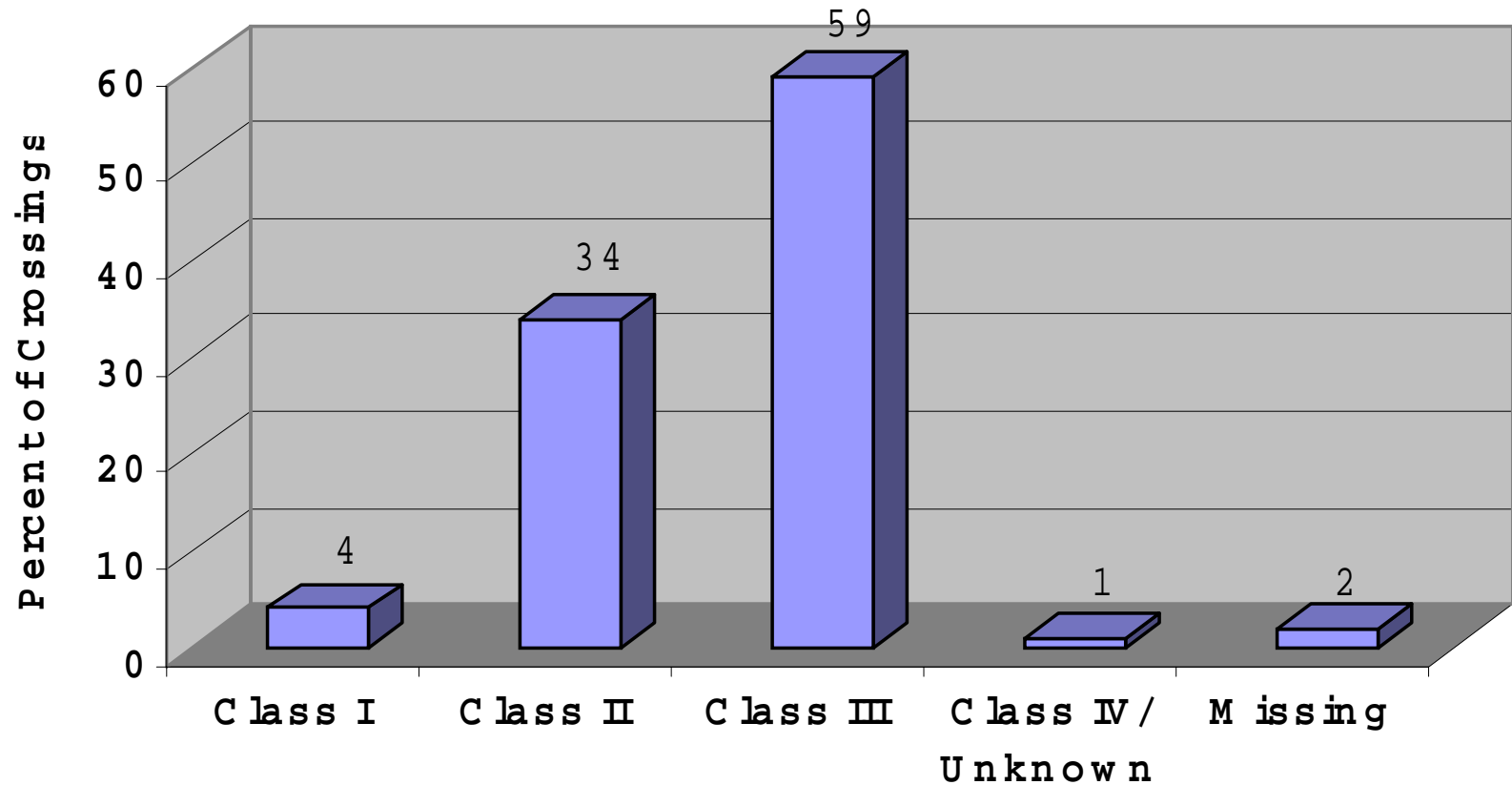
- 221 culverts
 - 149 existing culverts
 - 72 new culverts
- 89 non-culverts (fords),
- 41 removed/abandoned
- 6 bridges

289 Watercourse Crossings
evaluated for
effectiveness

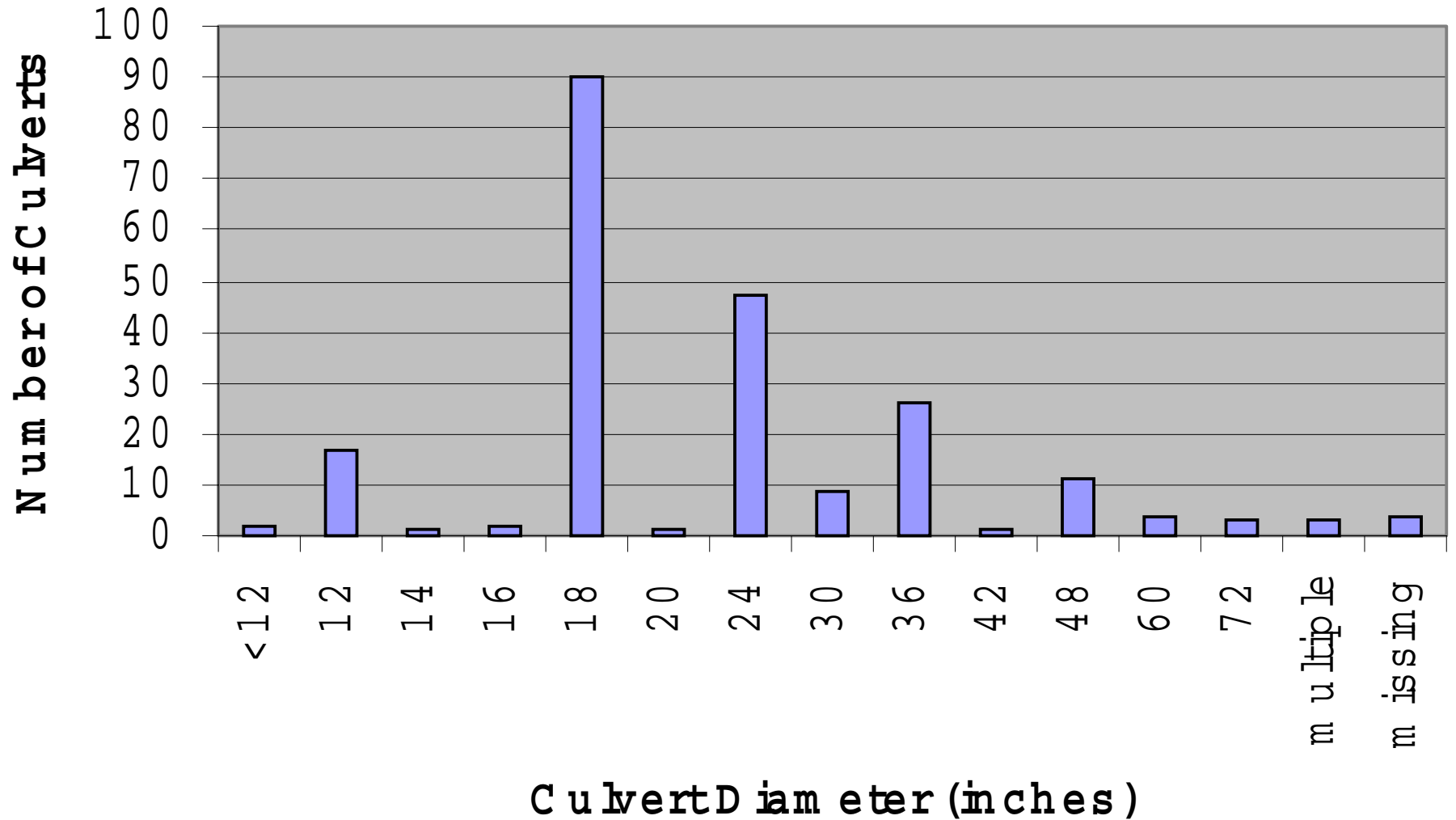
Watercourse crossing types for Implementation and Effectiveness Evaluations



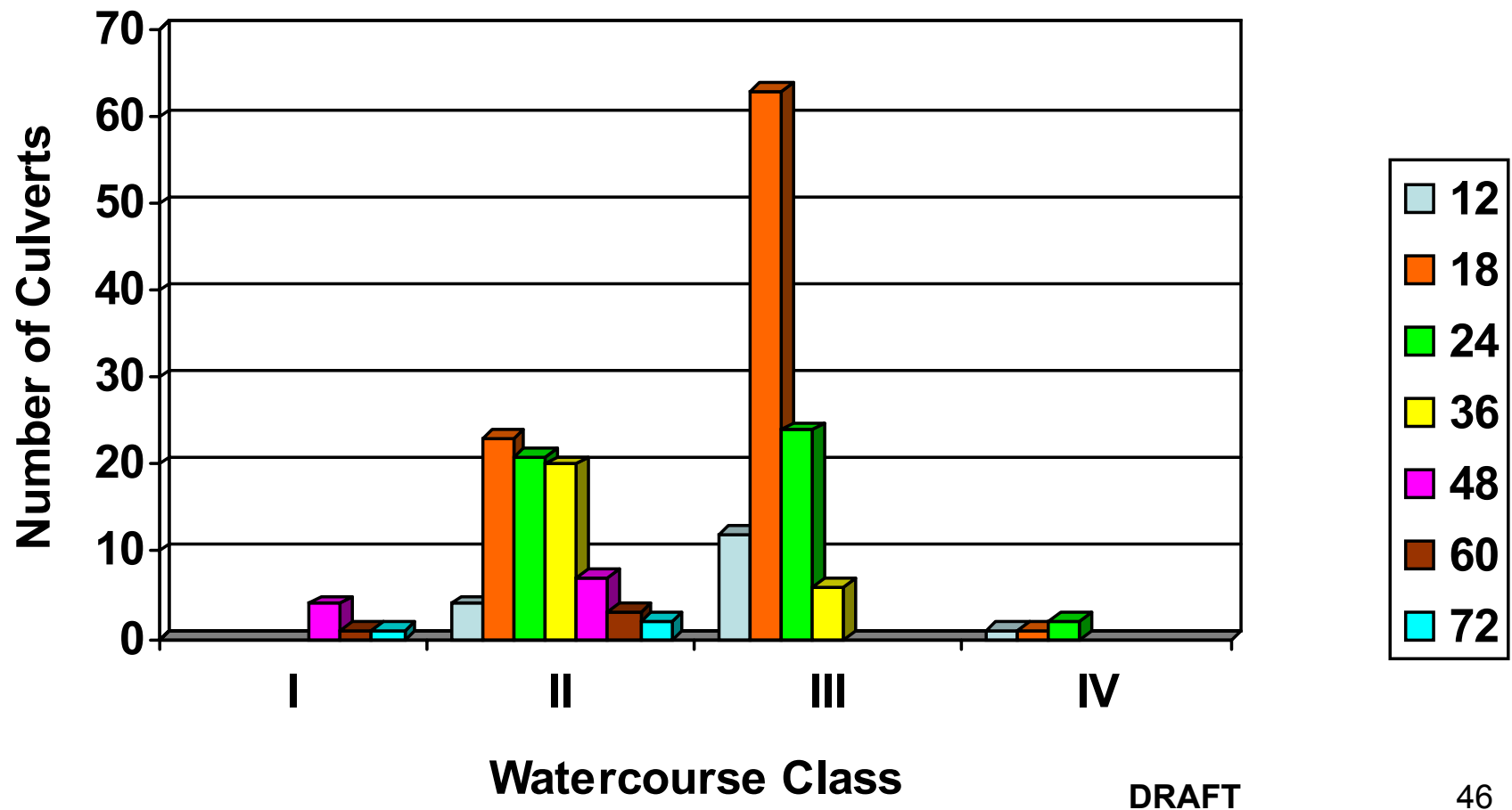
Percentages of Sampled Watercourse Classes



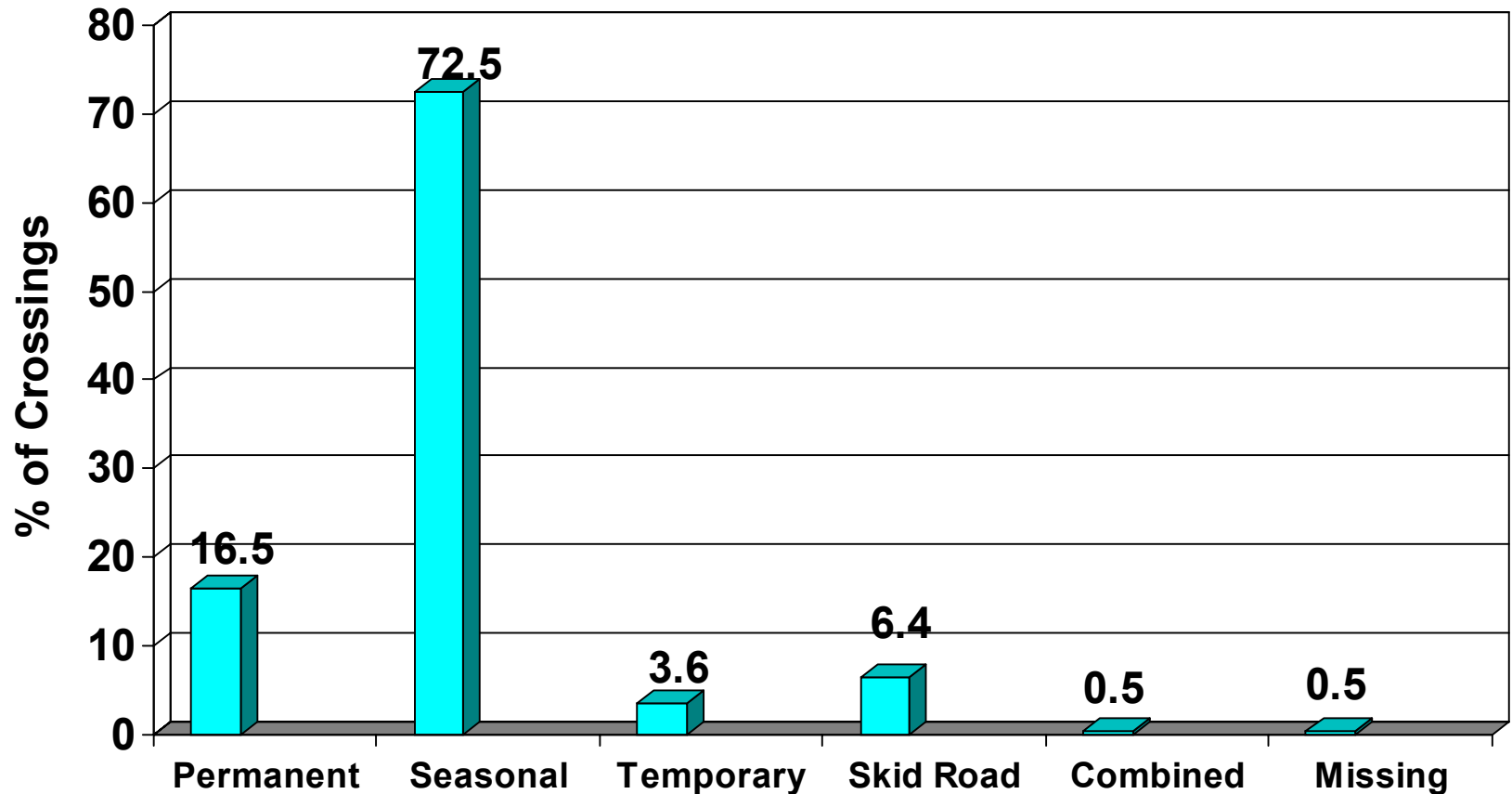
Culvert Size Distribution



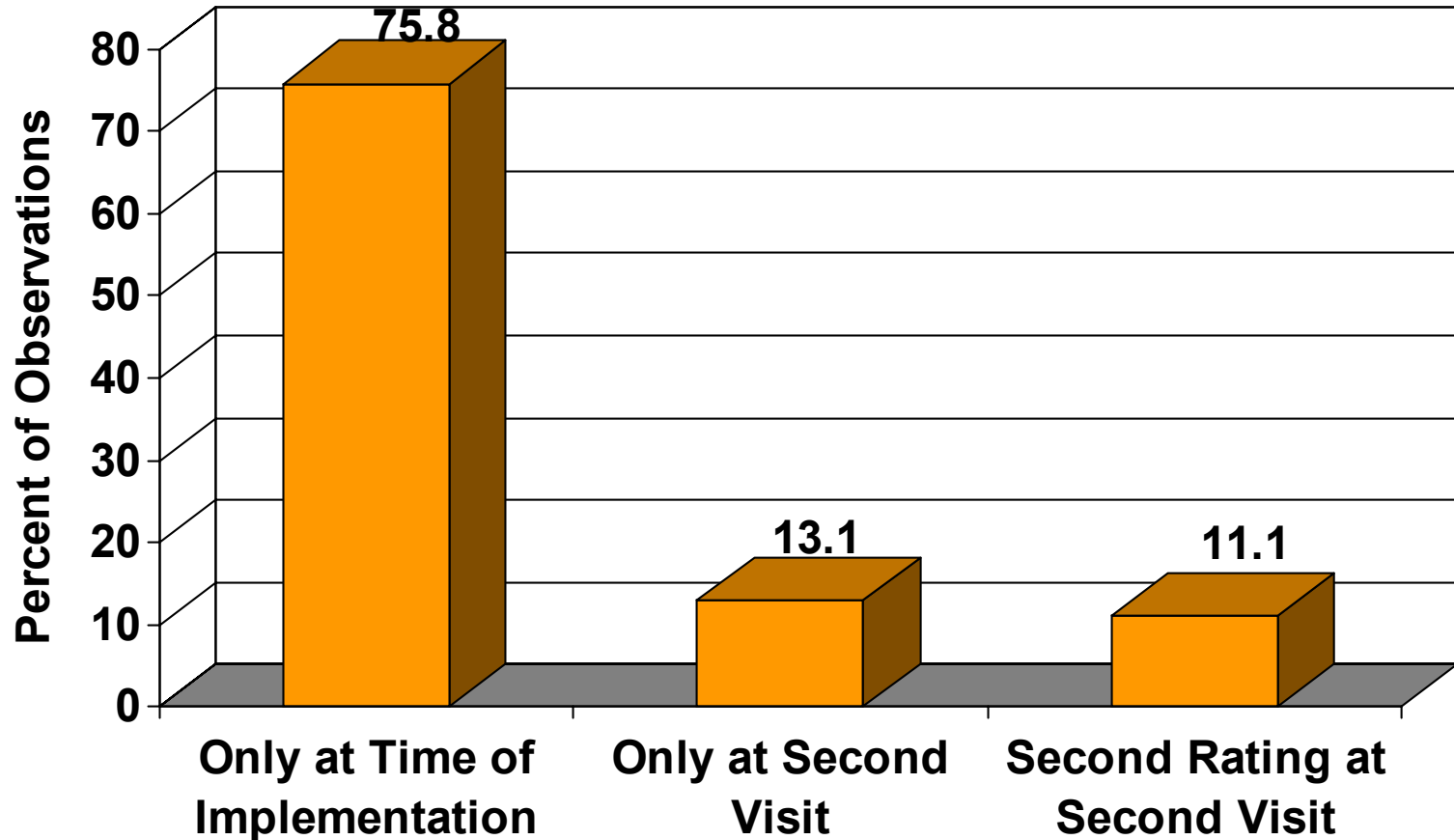
Distribution of Culvert Diameter Categories by Watercourse Class



Distribution of Crossings by Road Type



Distribution of Effectiveness Rating Time Periods



Modified Completion Report Monitoring **Watercourse Crossings:** **Implementation**



Crossing Implementation Ratings

- Departure (D)
- Marginally Acceptable (MA)
- Acceptable (A)
- Exceeds Rule Requirement (ER)
- Not Applicable (NA)

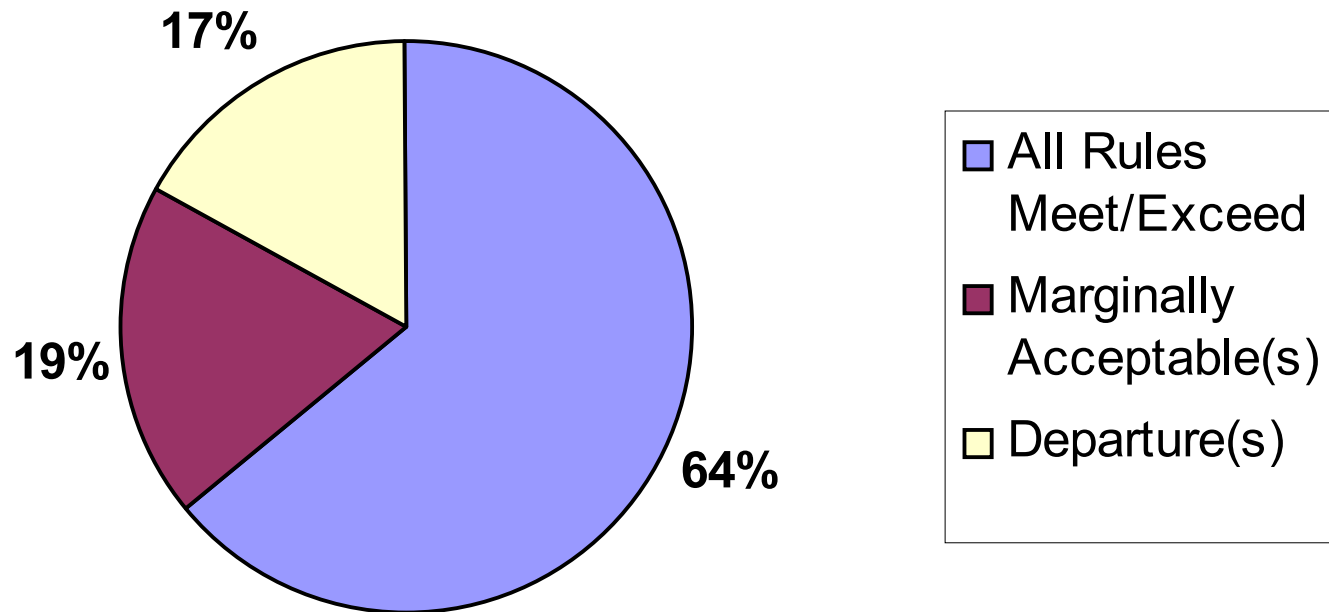
Applied to 27 Road Rules (14 CCR 923)

Applied to 3 Skid Trail Rules (14 CCR 914)

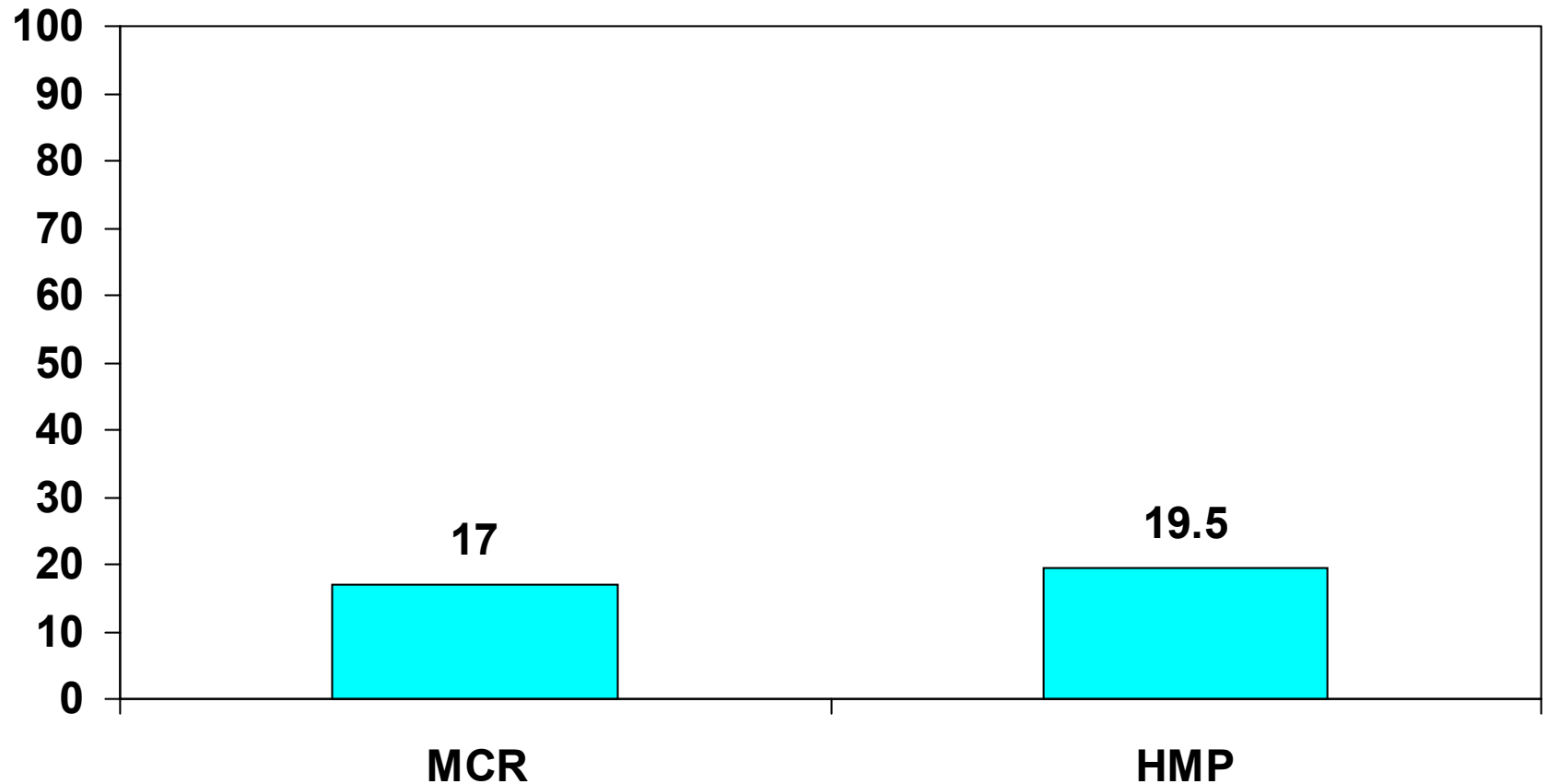
Rule No.	Description	Total Obs.	Departure (%)	D + MA (%)
923.(d)(1)	Removed crossing—fill excavated	91	7.4	21.3
923.4(n)	Diversion potential—crossing maintained to prevent	246	6.9	18.7
923.2(i)	Trash rack installed where needed	65	6.2	23.1
923.8	Abandoned	35	5.7	14.3
923.8	crossings—maintenance free; min. conc.	35	5.7	8.6
923.8(b)	Abandoned crossings—stabilization of	35	5.7	8.6
923.8(c)	cuts/fills Abandoned crossings—grading of road	36	5.6	11.1
923.4(m)	Inlet/outlet structures—repaired or replaced	130	5.4	19.2
923.3(f)	Diversion potential—crossing built to prevent	301	5.0	18.3
923.4(l)	Drainage structure/trash rack maintained/repaired	127	4.7	11.0

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MCR Crossing Implementation



Percent of Crossings with One or More Departures (MCR) or Major Departures (HMP)



Modified Completion Report Monitoring

Watercourse Crossings:

Effectiveness



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Crossing Effectiveness Categories

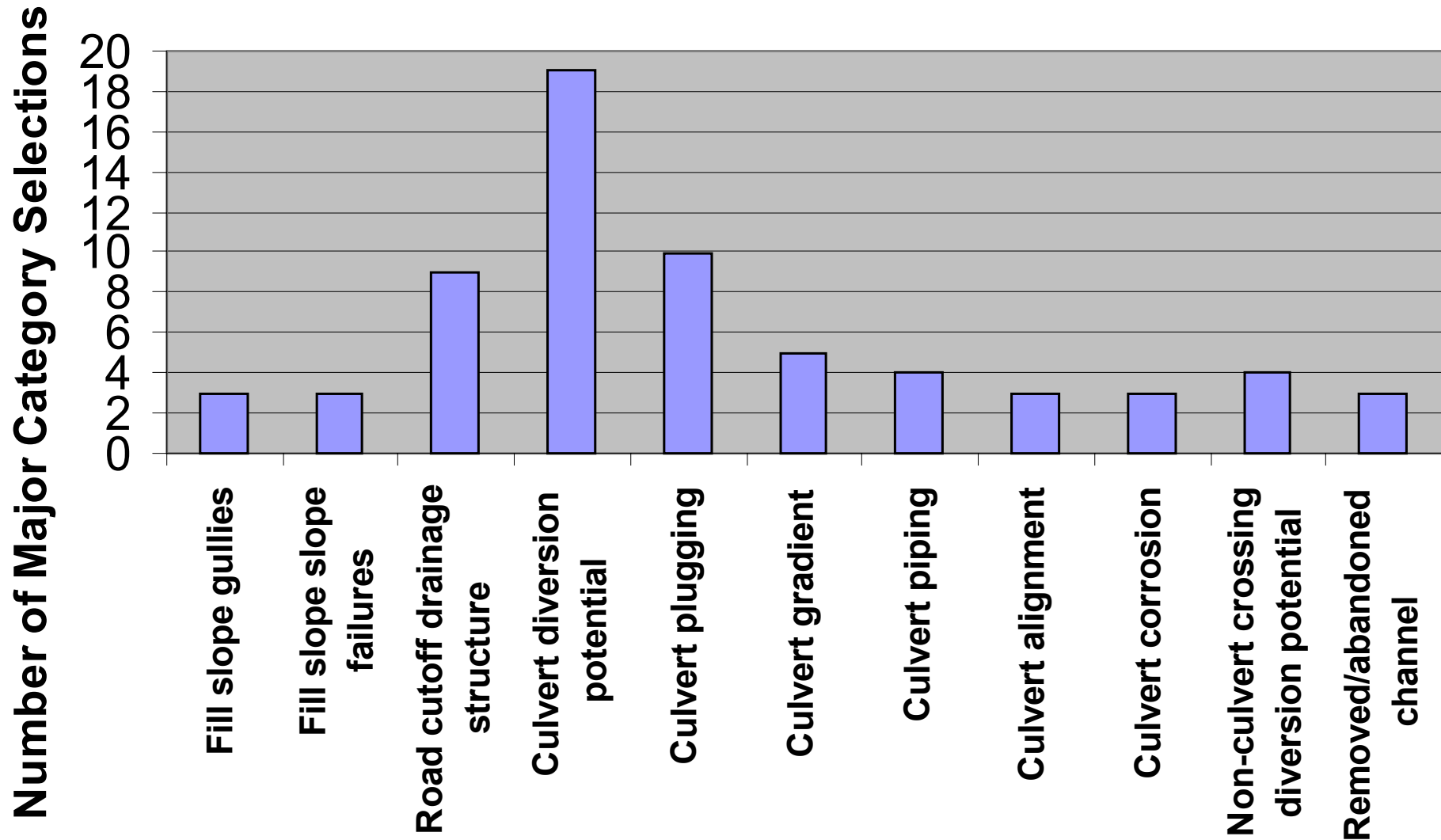
27 Features Rated for Effectiveness fell under the following 5 categories:

- Fill slopes (3)
- Road surface drainage to the crossing (5)
- Culvert design/configuration (10)
- Non-culverted crossings (3)
- Removed/Abandoned crossings (6)

Crossing Effectiveness Categories

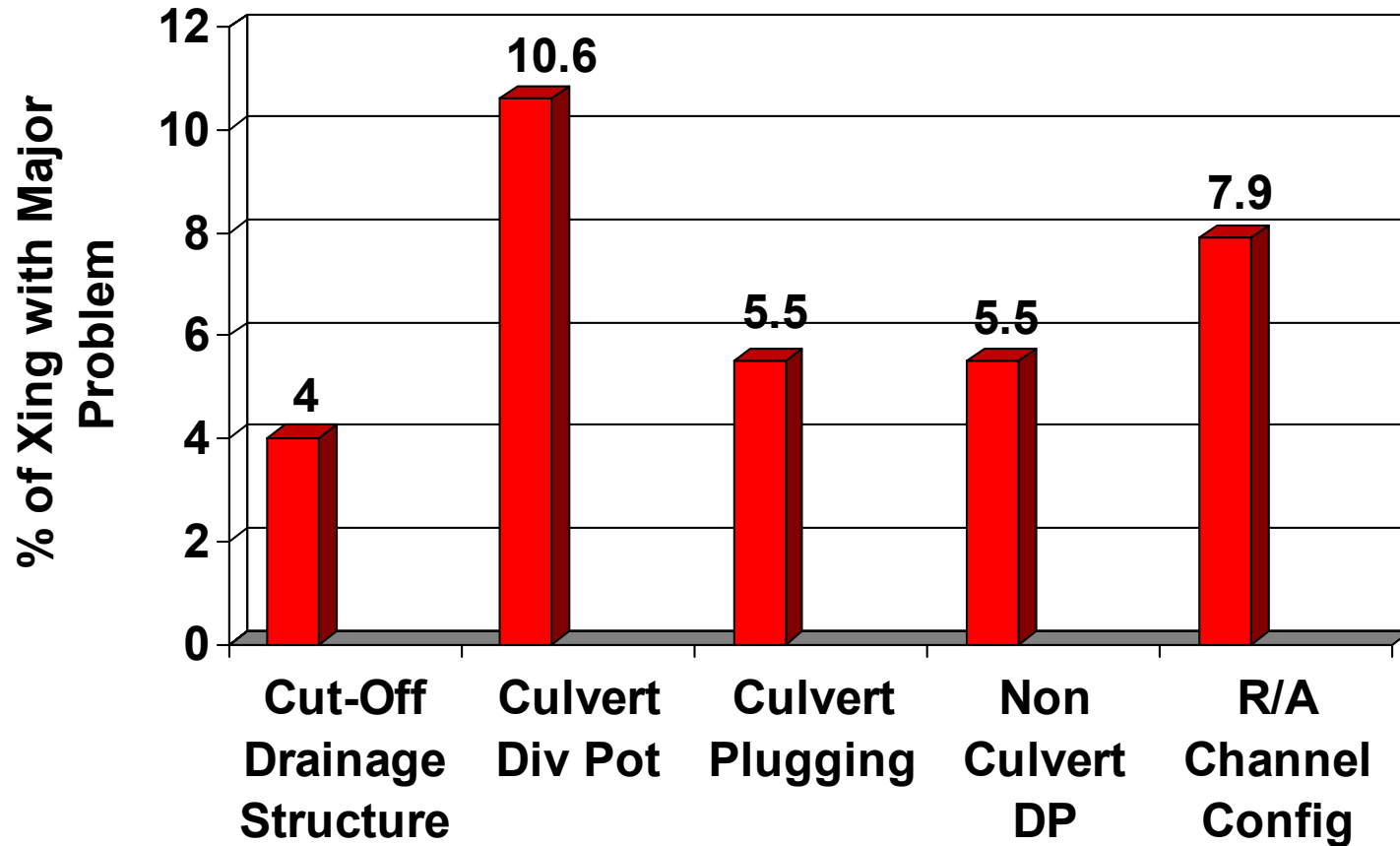
- Not Applicable (NA)
- Not a problem (none or slight)
- Minor problem
- Major problem

Counts for Major Problem Effectiveness Categories



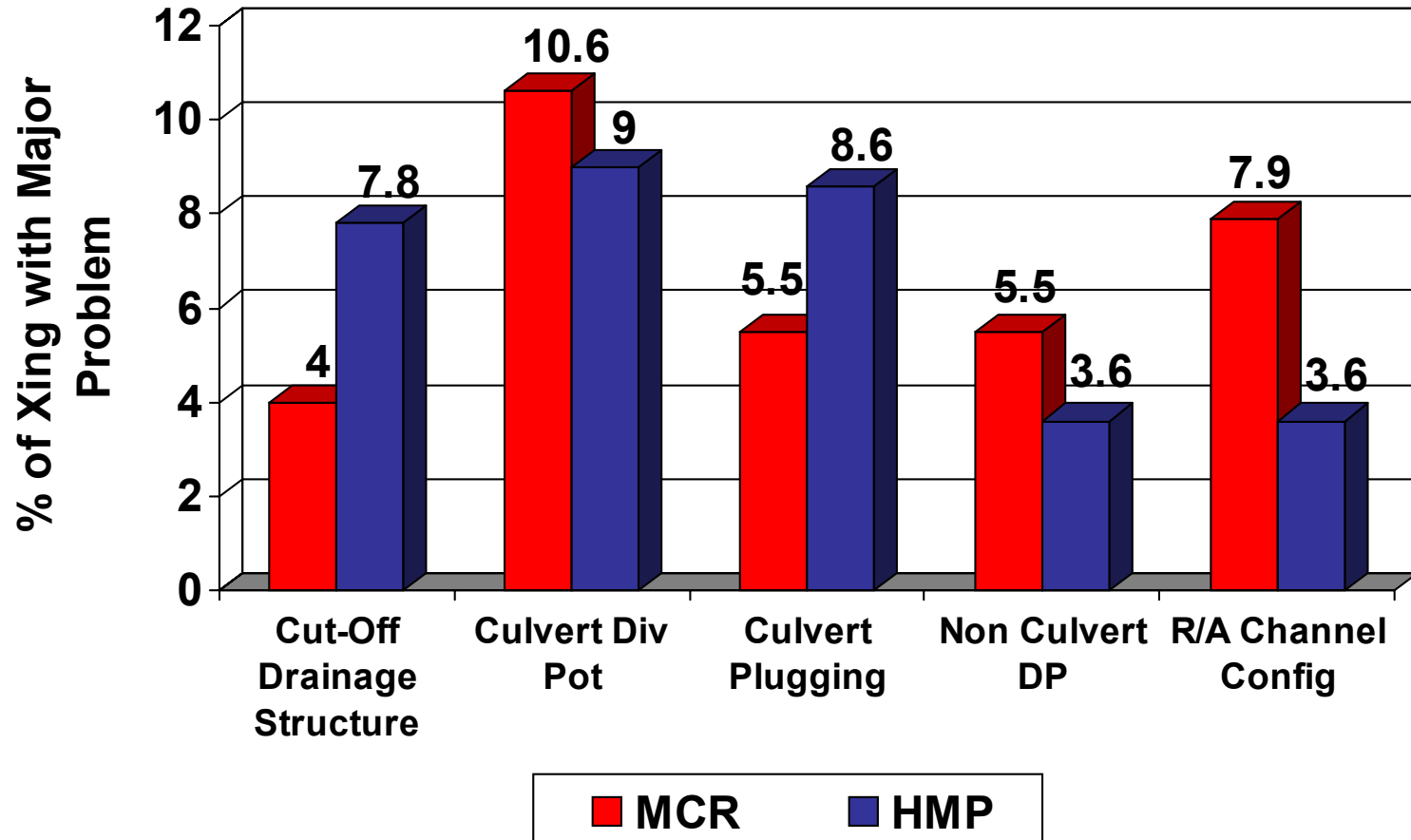
76 major problems from 53 crossings

Percent of Crossings with Major Problem Types (when applicable)



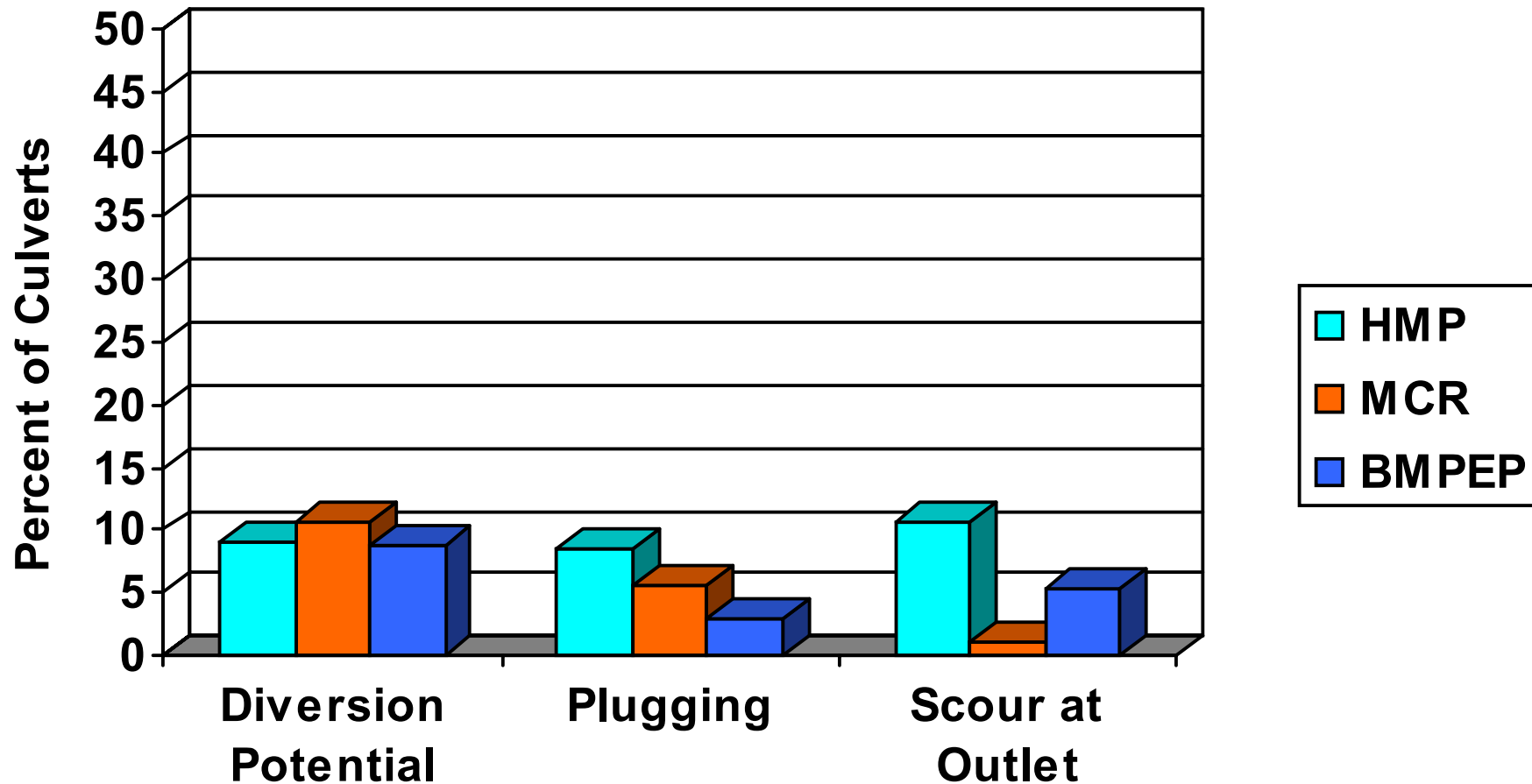
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Percent of Crossings with Major Problem Types (when applicable)



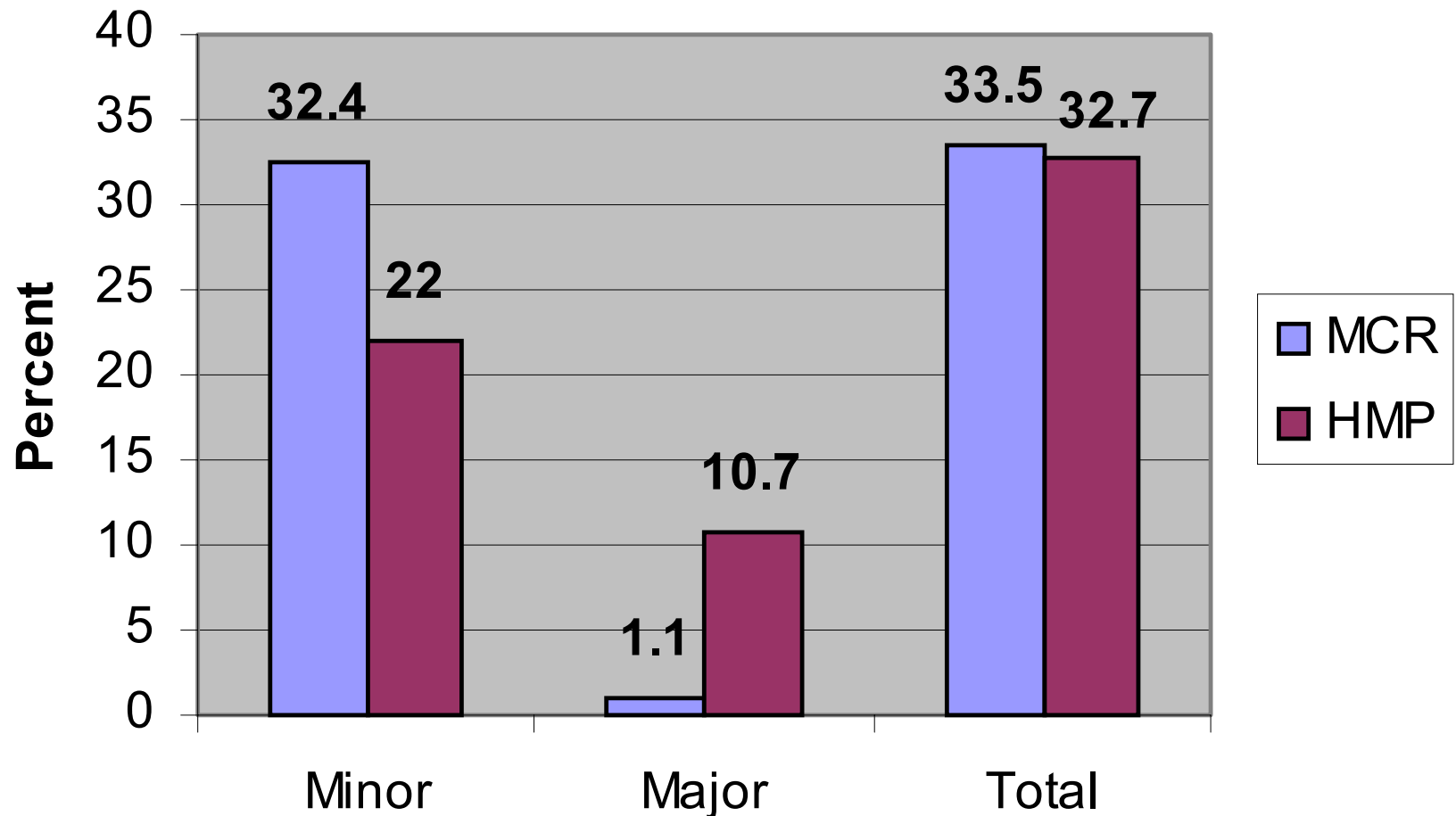
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Comparison of 3 Problem Types for MCR, HMP, and USFS BMPEP



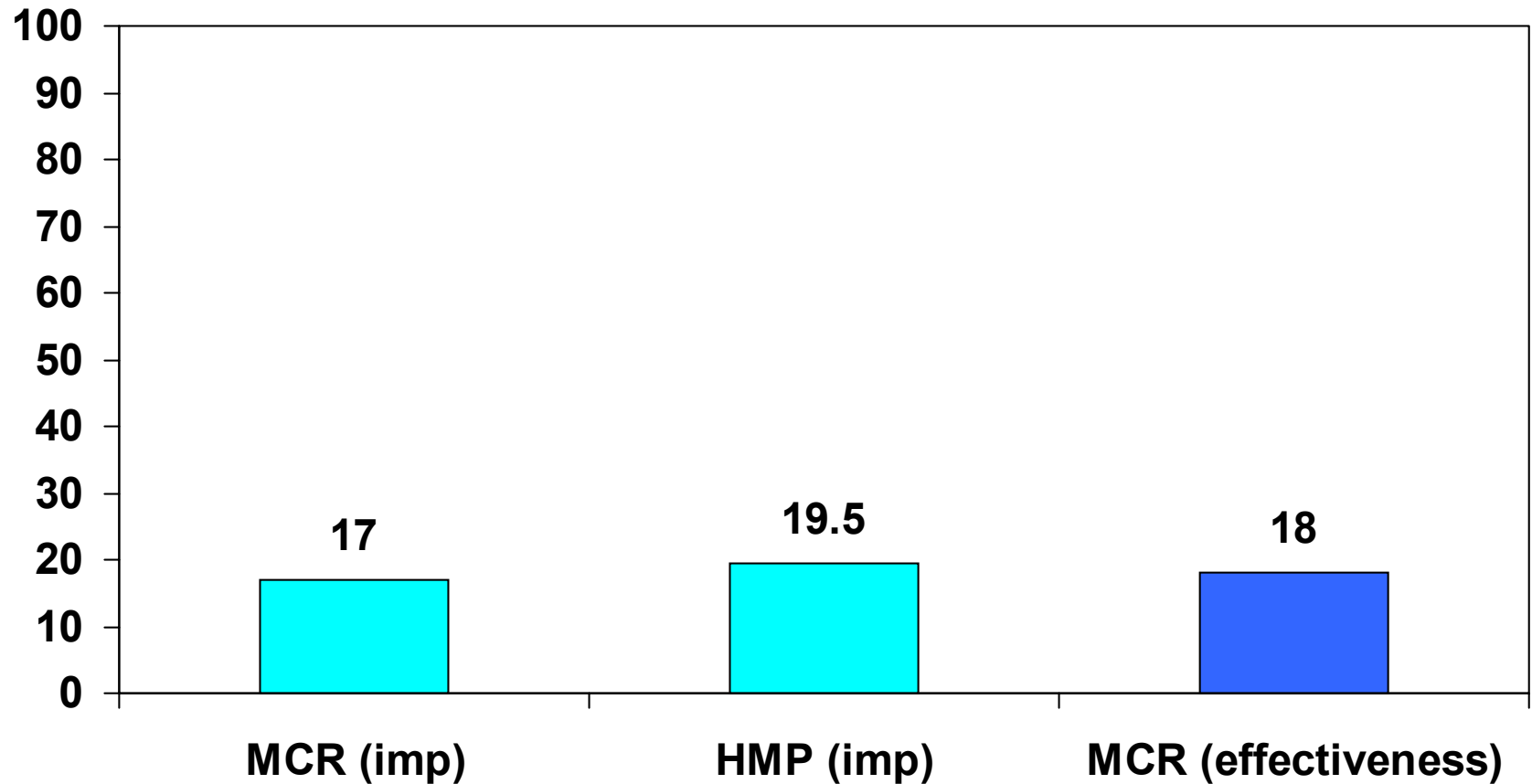
Culvert: Scour at Outlet

MCR vs. Hillslope Monitoring Program (HMP)

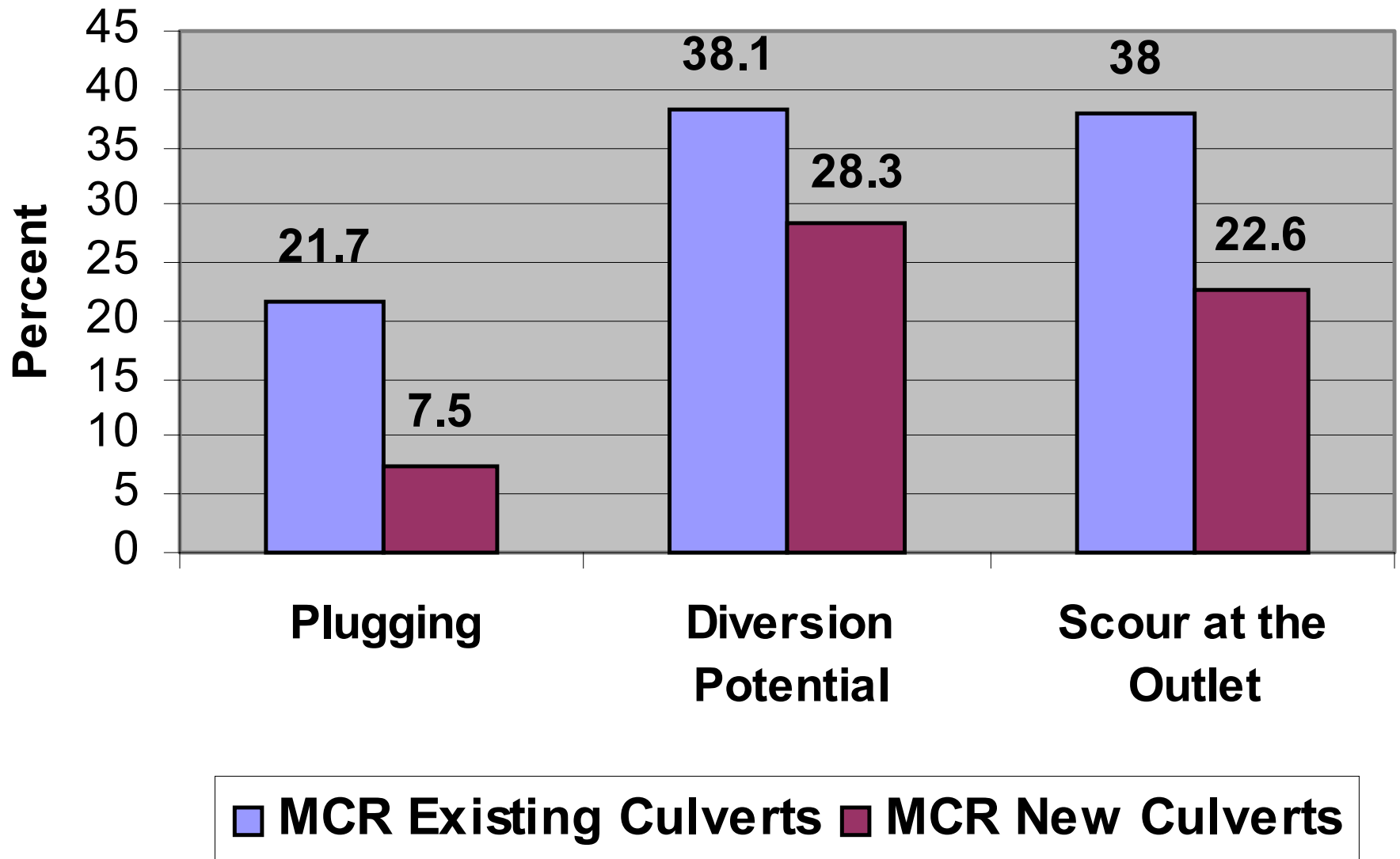


MCR: n = 181; HMP: n = 336

Percent of Crossings with One or More Departures (MCR), Major Departures (HMP), One or More Major Problems (MCR)



Comparison of MCR Existing and New Culverts for 3 Problem Types (Major + Minor Categories)



Conclusions



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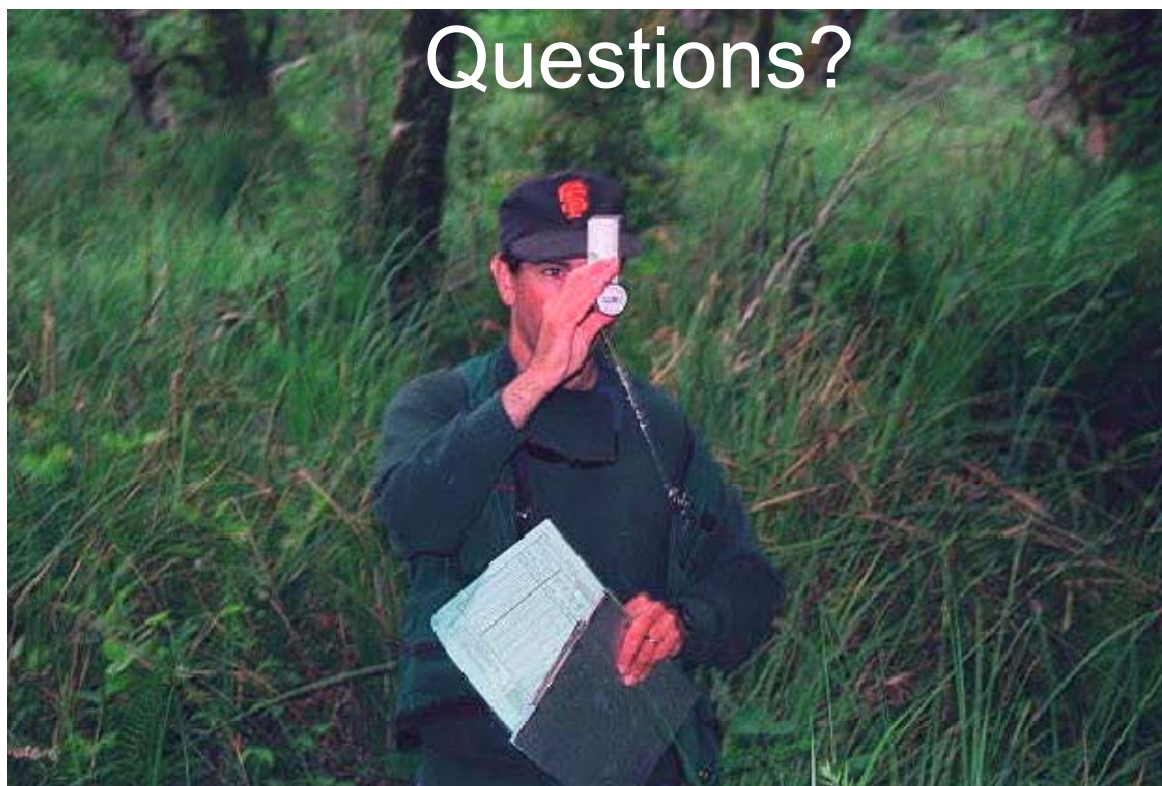
Like HMP, MCR monitoring found:

- The rate of compliance with FPRs designed to protect water quality and aquatic habitat is generally high, and
- FPRs are highly effective in preventing erosion, sedimentation and sediment transport to channels when properly implemented.

For the Future

- WLPZ sample size should be minimized to the extent possible to save time.
- Road form and evaluation method needs to be revised to ensure better data and to focus on drainage and discharge.
- Watercourse crossing form needs slight revision to ensure that all the applicable FPRs and none of the non-applicable FPRS are evaluated.

Modified Completion Report Monitoring



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